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The impact of positive emotions on altruism in the presence of familiarity

A thesis presented

by

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Dedication

I dedicate this work to my father who once told me that one day I will love statistics, and he was right. I also want to dedicate my current and future academic efforts to my country, Bulgaria. I hope one day She will be proud of me.

Посвещавам тази магистърска работа на моя баща, който веднъж ми каза, че един ден ще заобичам статистиката и се окажа прав. Също така искам да посветя настоящите и бъдещите си академични усилия на моята родина, България. Надявам се, че един ден Тя ще се гордее с мен.

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Abstract

This research studies the impact of positive emotions on altruism in different social contexts (or degrees of familiarity). In other words, it investigates to what extent emotional inducement techniques are able to stimulate pro-social behavior among perfect strangers and among real-life friends.

A growing body of literature has studied the complex nature of emotions and their role in the decision making process. Other scholars have investigated how social networks influence people's behavior. Yet most of the laboratory experiments in the field have focused predominantly on negative emotions, while keeping the subjects anonymous to each other without account for familiarity. To address this research gaps, I designed an experiment that compares four different treatments - a control group, a positive emotions group with strangers, an emotionally neutral group with friends, and a positive emotions group with friends. The participants in all groups were matched in pairs and played the "dictator game".

The results from the statistical analysis show that friendship is a highly significant predictor of altruistic behavior – the dictators in these treatments redistributed more money on average. On the other hand, positive emotions are not statistically significant, thus, failing to reject the null hypothesis. I look at three social theories that provide explanations for the strong connection between social relationships and altruism. Furthermore, I discuss why the emotional framing was not successful and stress on the role of negative emotions to provoke empathy and desire to help others. Additionally, I analyze the self-reported justifications of the subjects who pointed to sense of fairness and equality as their main motives to redistribute more. All of the presented arguments reveal the ambiguous nature of pro-social behavior - pure versus impure altruism.

Despite some limitations, my experiment produced valid and interesting findings that raised some questions for future research.

Keywords: Experimental economics, laboratory experiment, altruism, familiarity, positive emotions, dictator game.

Table of Contents

	Page
Dedication.....	2
Acknowledgements.....	3
Abstract.....	4
Chapter I: Introduction.....	6
Chapter II: Literature Review.....	10
1. <i>Psychological and neuroscientific evidence</i>	10
2. <i>Previous laboratory experiments involving emotions</i>	15
3. <i>The power of social networks</i>	17
Chapter III: Methodology.....	21
1. <i>Experiment's design</i>	21
2. <i>Research methods and models</i>	23
3. <i>Ethics</i>	27
Chapter IV: Results and Discussion.....	28
1. <i>Descriptive Statistics</i>	28
2. <i>Hypothesis testing</i>	33
3. <i>Regression models</i>	38
4. <i>Discussion</i>	40
Chapter V: Conclusions.....	53
Appendices (A-E).....	56
Bibliography.....	61

“The emotional tail wags the rational dog.”- Jonathan Haidt

“Reason is, and ought only to be, the slave of the passions, and can never pretend to any other office than to serve and obey them.” – David Hume

Introduction

I find this quote by the American social psychologist J. Haidt remarkably apt if we want to explain human behavior using metaphors. We are used to think of ourselves as fully rational individuals that follow logical conclusions and rely on authentic evidence. The entire focus falls upon the “rational dog” – our reasoning – while neglecting the “emotional tail”. We are “rational” - we keep saying that to ourselves. This is indeed right, but just partially, since we cannot get rid of our “emotional tail” – it will chase us, no matter where we want to go to. Thus, in order to understand the nature of human thinking, or decision making, we need to take the “dog” and the “tail” as a unity. Unity, defined by our own genetic evolution as a social species. The latter states something very important – it is not just the “dog and its tail”, but also the other “dogs and tails”, and the communication with them that matters. In fact, our societies are based on constant connection, interaction, and cooperation. In this process, though, one thing is clear – others trigger emotions within us.

Looking at our “social” genes, modern genetics and evolutionary biology has found that certain genetic factors can explain prosocial behavior (Sturgis et al., 2010; Rubenstein and Kealey 2010). But why did we evolve this way? To answer this question, we need to refer to the multilevel selection theory. Wilson and Cox (2012) explain that each population is divided into subgroups between which social interaction occurs. Natural selection first maximizes the fitness of each member compared to its peers. If the provision of the public goods requires some costs, then this implies disadvantage to the individual. Hence, it seems that altruistic behavior has no chance to be successful and to be adopted by the entire population. However, this assumption may not hold true if we add another level of selection, that is, between-group

selection. This means that cooperators will survive and reproduce better than the free-riders, even though the former would be less fit than the latter. Which level of selection will prevail depends on their relative strength. Some factors are important here: the frequency of genetic variation of altruistic and selfish genes within and among groups; the amount of the individual cost for providing the public good; genotype- phenotype relationship; the evolution of a rewarding and punishing system. This may serve as a logical explanation how our species evolved by suppressing non-cooperative behavior (within-group selection) and promoting altruism and collaboration (in favor of between-group selection). Moreover, a theory suggested by William Hamilton (1963) also shows that altruistic behavior may emerge without reciprocity. An individual will help his relatives without any direct benefit because the evolutionary fitness of shared genes can be increased in this manner.

Even though altruism has been a part of our social evolution and of our inner emotional world for so long, the term was coined only just in the 19th century by the great French philosopher Auguste Comte¹. Some modern definitions of that term try to capture its essence. For example, Hoffman (1982) defines it as a behavior that benefits the other without any particular self-interest. Krebs (1970) claims that a person is an altruist if he or she is willing to sacrifice rewards for the sake of the others. Staub's (1979) definition proposes a broader understanding of altruism. It states that this is a behavior in favor of the others regardless of its motivation.

All this being said, we can conclude that altruism is an expression of concern about the well-being of the others. One could argue that such concern is capable of provoking certain personal feelings and desire to help. Then, if scientists agree that emotions play significant role in the way people make decisions², and that we are “programmed” to connect and cooperate, our own emotional responses to the behavior of others can probably predict how successful a particular cooperative mechanism would be, simply because pro-social³ behavior depends on the individual's decision to contribute, and the individual's decision is dependent upon emotional reactions. Surely, one cannot explain collective action problem, or why cooperators and free-riders coexist, entirely by referring to emotional bias. The “me versus us” dilemma is much more complex than that. Many scholars from different scientific areas have contributed to solve this enigma. Economists are no exception.

¹ <https://www.britannica.com/topic/altruism-ethics>

² An overview of this claim is presented in the Literature Review

³ I use the terms “cooperative” and “prosocial” interchangeably.

Classic economic models have tried to provide arguments about individual and collective behavior. Most of the predictions in economics are based on rational choice theory: it assumes fully rational and selfish individuals who make logical decisions to maximize their utility when faced with a certain constraint. However, the way agents make decisions in reality often contradicts what theoretic models predict. Therefore, the need to find a more comprehensive explanation has inspired economists to take a broader look at this issue. During the last three decades some scholars have adopted a multidisciplinary approach to understanding human behavior. It involves cognitive psychology, neuroscience and game theory in order to explain why agents tend to deviate from entirely rational behavior as assumed. The outcome is that behavioral economics has emerged to answer the question why people often act in a way that does not maximize their expected utility. For instance, if a fully rational individual would always prefer something to nothing, why, in many experiments, do participants choose different options that are inferior to the best solution? These types of studies, comprising game theoretic experiments, framing, heuristics, market inefficiencies and even MRI, try to catch and present factors that have been dismissed so far. Yet further investigation in the field is needed to build up a better understanding of economic behavior and public choice. First, most of the academic work has been focused on emotional responses and cooperation predominantly regards negative emotions such as shame, guilt, remorse (Barr, 2001; Bowles and Gintis, 2003), while neglecting the positive ones, such as joy, pleasure, and sense of belonging to a group. Second, how the type of connection between the subjects in the experiment alters their contributions needs to be explored further.

Inspired by this fascinating scientific area, and trying to address the research gaps mentioned above, I dedicate my efforts to study the complex nature of human cooperative and altruistic behavior, even though my own research is just a small drop in the stormy sea called experimental or behavioral economics. However, with my current work, presented as a Master's thesis, I intend to address three major issues.

First, the purpose of this research is to study the complex connection between emotions and decision-making process, and particularly, their role when it comes to altruism. By creating framing effects, my study aims to explore the impact of emotions on the decision each member of a pair would make in the case of redistribution of goods.

Second, I seek to investigate if the presence of familiarity provides a stronger emotional inducement for people to increase their willingness to contribute. I compare treatments that

reflect the impact of emotions and familiarity, and how they influence our decisions subconsciously.

Third, with my current work, I would like to share some thoughts about rational choice theory and other theories that explain social behavior. Human beings believe they act rationally without perceiving they are biased by their own feeling or moods. Therefore, this study intends to be just one of many steps that intend to shed more light on the limitations of rational choice theory and classical economic models, and to suggest ways in which theory and models could be expanded to take into account the role of emotions.

For this reason, I aim to answer these three research questions in the working process:

1. What can these findings tell us about rationality, emotions and decision making?
2. To what extent can human rational behavior be influenced by creating a frame and provoking emotions in order to stimulate cooperation?
3. Can this effect be enhanced in the presence of an “object”, towards which the emotional response is directed, i.e. when playing with/against a member of the subjects’ social network (e.g. a friend)?

My research is part of the fast-growing and rapidly developing scientific field of behavioral economics. I argue that the chosen direction is vital for the better understanding of decision making in economic games and human nature in general. Moreover, if social sciences concentrate on developing models that predict and explain why agents act in a certain way, a systematical knowledge about human behavior that takes the human being as a unity of rationality and emotionality is demanded. It is in this theoretical background that I place my research, which could be a foundation for a future work.

This thesis is structured as follows. First, I present the knowledge in this field brought to us by previous research and academic work. I divide the body of my literature review in three major parts: psychological and neuroscientific framework; previous lab experiments in the field; the power of social networks and some real-life cases of successful long-term cooperation in small communities that show how familiarity and interpersonal relations work in practice. Then I elaborate my methodology and my laboratory experiment’s design, and mention some ethical considerations. In the third chapter, I show the results, analyze them, and provide possible explanations of the outcomes derived from my study. Additionally, I comment on the drawbacks and problems of my research, and provide some suggestions about future work. The last section concludes.

Literature Review

I divide the body of my literature review into three major parts. First, I present some evidence about how emotions influence rational decision-making suggested by cognitive psychology and neuroscience. Then I refer to various studies that include emotions and their impact on cooperation and altruism tested in laboratory settings. The third part gives insight into social networks and how they shape our willingness to collaborate with others.

Psychological and neuroscientific evidence

Explaining human behavior or how we think has never been an easy task. Probably one of the most famous names currently in cognitive psychology is Daniel Kahneman. In his book “Thinking fast and slow”, the author describes the mechanism of thinking as driven by two different systems. Kahneman defines them as:

„System 1 operates automatically and quickly, with little or no effort and no sense of voluntary control.”

„System 2 allocates attention to the effortful mental activities that demand it, including complex computations. The operations of System 2 are often associated with the subjective experience of agency, choice, and concentration.“ (Kahneman 2011, 18)

Kahneman argues that our mind uses them both in performing daily tasks by switching between them. System 1 is said to run “automatically” and System 2 operates on full capacity only when a deeper processing of information is needed. “Impressions, intuitions, intentions, and feelings” (page 20) occur in System 1 that sends them as signals to System 2. If the latter adopts them, they turn into beliefs and voluntary actions. Although this process functions smoothly, there are still errors, because System 1 is biased (i.e. its focus is familiar situations, short-term predictions, and initial reactions to challenges) and therefore produces false beliefs and predictions in certain circumstances. This means that situations, in which System 2 and its problem-solving abilities are required, System 1 takes control and provides wrong answers.

Kahneman claims that System 1 cannot be turned off. I argue that this statement actually lies at the core of a new understanding about rational behavior and how such behavior will be blurred by the activities of System 1. If strong emotions, for example, occur in one’s mind, in

short-term they might prevent the intervention of System 2 and thus result in different choices or decisions.

In his work, Kahneman quotes Paul Slovic (Slovic et al., 2002, cited by Kahneman, 2011) and his research about formation of opinions based on feelings. Slovic coined the term “affect heuristics” to describe how “people make judgments and decisions by consulting their emotions: Do I like it? Do I hate it? How strongly do I feel about it?”(Kahneman 2011, 115). The question about the real characteristics of a certain object is substituted by the question how we feel about it. People tend to choose something simply because they like it, not because there is a considerable and objective evidence to act so. Slovic et al., followed in the steps of the neuroscientist Antonio Damasio (1994,1996, cited by Kahneman 2011), who claimed that “emotional evaluations of outcomes, and the bodily states and the approach and avoidance tendencies associated with them, all play a central role in guiding decision making” (Kahneman 2011, 115). In other words, emotional states play a considerable role in the process of making a decision when choosing between different options or building preferences.

The discussion on emotions and how they affect us is the focus of the book “Explaining Social Behavior” (2007) by Jon Elster. According to Elster, emotions are accountable for “the most important sources of happiness and misery”, “action tendencies that are associated with the emotions” and “their impact on other mental states, notably on beliefs” (Elster 2007, 145). He also analyzes the decision-making process and shows how emotions influence rationality. In his model, Elster assumes three important requirements for “rational action” (Elster 2007, 191):

1. “The action must be optimal, given the beliefs.”
2. “The beliefs must be as well supported as possible, given the evidence.”
3. “The evidence must result from an optimal investment in information gathering“

The model looks stable, but if emotions are introduced, the assumptions above about rational choice may not hold. For instance, if person X prefers A to B when under the influence of emotions or drugs, he or she may choose B to A in every other situation. The rational decision making process may be plotted schematically as follows:



We can follow Elster's thoughts on how emotions influence each stage. First, feelings that provoke urgency and low future-discounting may lead to insufficient gathering of information and poor evidence. Second, an emotion-induced bias is formed in the belief system. Third, an action readiness occurs that becomes stronger with the intensity of the transient feelings. Thus, a desire to act immediately may be harmful or non-optimal.

Moreover, we need to recall that none of us can isolate him/herself completely when making a decision. As Elster points out, some emotions are often transmuted into others because of social norms that judge the former as unacceptable. This testifies for the existence of hidden motivation justified by different reasons in order to be consistent with the moral imperative. An emotionally-charged situation can also twist the rational mechanism since nobody can fully disregard the emotions of other agents who face a similar decision. Lastly, the evidence each individual relies on could be based on the irrational actions of somebody else.

The emotional impact on each stage of the decision-making process and the interaction with other people's feelings lead us to the two limitations of rational choice theory stated by Jon Elster. Indeterminacy (Elster 2007, 207-208) exists when the person is indifferent between several options or his preference might be incomplete and when he or she finds it difficult to determine "optimal investment in information gathering". The second one is irrationality (see Elster 2007, chapters 12 and 13).

Jon Elster suggests a broader understanding of the phenomenon by introducing the term "non-irrationality". To shed more light on "non-rational" mechanisms, a considerable body of literature deals with these issues. In her review, Virlics (2013) argues that emotions play an influential role in decision-making and stresses the importance of studying the interaction between their effects and the cognitive processes in our mind. She organizes the main psychological factors suggested by behavioral economics and neuroeconomics into two groups: biases and preferences in decision making.

Dr. Steven Stosny (2017) indicates that shared emotional response is the core of cooperation, therefore, emotions are highly contagious. Not only that, but also the way we feel from the inside is often projected onto others. Does the latter mean that people are also willing to share their victories, trophies or success with others when they feel happy? My experiment will put this hypothesis to the test, but what is also essential is that Dr. Stosny points out something very interesting: positive emotions are reciprocated by others 70% of the time, while negative emotions are returned back almost 100% of the time. Probably, this is one of the main reasons why experimenters prefer to provoke negative emotional responses in their subjects. Up to this point, this negative ratio can be a challenge in every experiment that deals with positive emotion induction.

Fassler and Haley (2003) take an evolutionary biological stance. According to them, cooperation is shaped by and even impossible without emotions. They point out their role in natural selection and the social evolution of our species in order to enhance biological fitness under certain conditions. The authors divide emotions into two major groups: emotions in dyadic relationships and in collective contexts. They stress the influence of pride and shame in collective action and cooperation. Although cultural differences do exist, there are similar features in every community and therefore the researchers should further investigate the impact of emotional behavior in maximizing utility viewed as a unity of personal bias and awareness about others' emotions. Fassler and Haley conclude that emotions have evolved as a completely "rational" phenomenon to ensure cooperation and the survival of our species.

One is not able to fully discover the complex nature of human emotions and pro-social behavior without investigating the physiology of the brain. Several studies provide evidence in this regard. Loewenstein (2000) and Loewenstein et al. (2001) claim that in addition to expected emotions, such as disappointment and regret, researchers should consider immediate emotions that occur during the process of deciding as well. To do so, Sanfey et al. (2009) examined the brain while making a decision. They found that the emotional system located in limbic areas can guide our behavior automatically or produce outcomes that would require otherwise significant efforts if undertaken consciously. Loewenstein et al. (2001) also reveal the dual mechanism that operates in our brain. According to their study, emotions have a decisive impact on cognition, because the signaling in the brain from the emotional system to the cognitive system (located in the frontal areas) is stronger compared to the opposite direction from the cognitive system to the emotional system. Thus, the neuropsychological evidence fully supports Kahneman's concept about the two systems.

De Martino et al. (2006) admit the influence of emotional, heuristic biases on decision-making process, and intend to shed more light on the underlying neurobiological basis. In their experiment, they use functional magnetic resonance imaging (fMRI), and find that decisions made in accordance with Prospect Theory coined by Kahneman and Tversky (1979; 1986) are related to higher levels of activity in the amygdala, while these subjects who chose contrary to the behavioral tendency predetermined by the framing effect showed higher activation in the orbital and medial prefrontal cortex, and, thus, acted more “rationally”. The results suggest an opponency between these two systems (recall Kahneman (2011) and his concept of System 1 and System 2), both contributing to distinct functional roles in decision-making.

Adolphs (2006) investigates what makes social cognition “special” by studying the role of the amygdala in processing stimuli from the social environment. He argues that moral judgements about other people directs our desire to behave with respect to them, that is to say, our motivation to help them or punish them, which is the setting in many laboratory experiments.

Finally, an interesting case is reviewed by Damasio et al. (1994). They examine the extraordinary case of Phineas Gage and compare his brain lesion with other patients with similar frontal lobe traumas. The researchers find that people with such malfunctions are unable to make rational decisions in personal and, more interestingly, social context, and their ability to process emotions is also damaged, while abstract thinking, problem solving and calculations are intact. For this reason, the authors argue that emotions and the regions of the brain responsible for them participate in decision-making, especially within the social domain.

All this being said, the way human beings evolved as a social species, the development of our cognition, and the structure of our brain, all point to the major role emotions play in decision making processes put in a social context.

Previous laboratory experiments involving emotions

When investigating altruistic models in public good provision, Andreoni (1990) coined the term “warm-glow giving”. He argues that people gain utility from the act of giving, expressed as a positive emotional feeling experienced when helping others. Therefore, the author presents an intermediate approach involving impure altruism.

Further light on how emotions influence our decisions has been shed by several experimental studies that investigate the link between emotions, cooperation and punishment. Haselhuhn and Mellers (2005) claim that people possess a taste of fairness and often act in a way to maximize their social utility, i.e. their subjective utility relative to others. They consider emotions in economic games as pleasure derived from the individual attitude towards social fairness and expressed by the ranking of preferences (payoff). The bigger the pleasure from fair distribution of resources, the greater the chance of cooperative behavior. Furthermore, Pillutla and Murnighan (1996) concluded that feelings of anger increase the probability of rejecting unfair offers. Lopez et al. (2012) suggest that the need to avoid social disapproval or gain social approval can stimulate cooperative behavior. They investigated whether emotions, such as shame and guilt, can be more effective than standard regulatory mechanisms and found that emotional pressure performed better than punishing with high economic penalties. Fehr and Gächter (2000) claim that negative emotional responses to free-riding behavior lie at the basis of successful cooperation. Players are ready to punish defectors even though the punishment imposes costs on them. The authors argue that this is caused by a sense of fairness. Furthermore, they confirm the wide spread notion in the literature that subject who play a finitely repeated game matched with the same peers tend to cooperate more than those who are matched with different players after each sequential round. Again, this laboratory result supports the role social connections play in achieving cooperation. Goeree and Holt (2000) shed more light on the reasons behind the discrepancy between Nash offers and actual offers in an ultimatum game. They outline the role of sense of fairness and equity considerations in the utility functions of the individuals, as well as the presence of noise, i.e. irrational behavior, and show that these two factors can be included in a general model.

Other studies (Koford, 2003; Anderson et al., 2008; Fehr and Schmidt, 1999) have investigated how inequality and demands for fairness impact collective action and cooperation. It becomes clear that the sense of inequity has important psychological effects. Even though the exact emotions are not mentioned explicitly by these researchers, one can claim that negative emotional responses reduce the tendency for cooperation, which is consistent with the literature.

Hegtvedt (1990) also highlights the importance of social context and the relative status when it comes to emotions provoked by an unfair exchange. Consequently, the sense of fairness and its inherent emotional responses are able to impact decision-making with respect to cooperative behavior and willingness to redistribute goods.

Other papers analyze the subsequent impact of transient emotions on behavior. For their part, Andrade and Ariely (2009) argue that incidental emotions have not only brief influence on current decision making, but last longer since subsequent context-related decisions are based on the previous ones because of behavioral consistency. They conducted an experiment in which participants were first exposed to a certain emotional frame and then played economic games. Their findings clearly support their hypothesis. Colasante et al. (2017) use music and images to provoke incidental emotions in an experiment involving emotional states and their impact on risk aversion. They find that the treatment effects do make the subjects more risk averse, exhibiting high susceptibility for the first lottery presented to the subjects with a diminishing influence thereafter. Their results support my expectation that transient emotional stimulus can influence behavior in a one-shot game for a short period of time after the framing effect has been induced.

The growing body of laboratory experiments tries to capture and quantify compound behavioral categories such as sense of fairness, altruism, desire to punish and reward, and decision consistency – all these being factors that cannot be dismissed when trying to explain social behavior. Inducing the right emotion and its relevance in the research context is a challenge many experimentalists try to address. I claim that my own study can contribute to that matter by showing the link between altruism and positive emotions.

The power of social networks

The next few pages intend to offer a brief overview of social connections and their impact on altruism and cooperation. One cannot study the mechanism without knowing the context in which it operates.

In their inspiring book “Connected” (2009), Fowler and Christakis speak of “homo dictyous” (ch.7, 221) – the “network man”. They argue that we, being a social species, not just form groups, but form networks, and our connections to these networks considerably define our happiness and life satisfaction. By taking the well-being of the others into account, friendship and loyalty wins over selfishness. Many game theoretic experiments prove this notion – subjects give something back, inconsistent with classical economy theory that predicts different outcomes. The explanation lies deep into our genes. Throughout the relentless struggle, he have gone through, called evolution, only those groups with the most fit social networks will win the game and survive. But what constitutes a “fit social network”? The Dunbar’s number, which is also quoted in the book (see Chapter 7), suggests that the cognitive limit of people with whom an individual can form and maintain stable social relationships is around 150. If this number is correct, then it is quite possible that people may distinguish between people outside of this circle and inside of it when deciding the amount of cooperation or altruism they are willing to offer. Hence, commitment and “share my victory” behavior can vary quantitatively depending on the other person’s social position or role related to the Dunbar’s number, for example.

Several graphs in Fowler and Christakis’ book depict the complex dynamics of social networks. But if one wants to analyze this complexity, one will need an appropriate model. Such model is developed by Faust and Skvoretz (2002) to compare different social groups based on the correspondence analysis for similarities among diverse networks. By drawing a sample of 42 networks from four kinds of species, they find that what defines similarities, is the kind of the relation, not the species. Furthermore, positive and negative relations tend to be mutual, while transitivity is predominantly linked to positive relations among the group members, thus, suggesting a positive “spill-over effect” in this particular set of networks. More light on the structure of social networks is shed by Adams (1967). He analyzed the main components of social relations and argues that there is “a significant linkage between consensus, affection, and interaction” (p.65). Adams contributed to the discussion by suggesting the term “positive concern”. Positive concern can be understood as an amalgamation between “need and obligation” and “long-term involvement and continuing interest”(p. 66). The author outlined some factors that are able to further the development of positive concern in interpersonal

relationships – common experience, gratitude for help, and sharing in the same life crises. On my behalf, I argue that the opposite causal direction is also plausible – positive concern could be a potential accelerator of prosocial behavior expressed as a desire to share and help those one is committed to.

Lawler and Thye (1999) systematize six different approaches that address the role of emotions in *social exchange theory*. They distinguish between negotiated and reciprocal exchanges, and highlight that the former is used to negotiate the terms of trade between two parties in a formal, unemotional and dispassionate context, whereas the latter allows for more emotional expressions and norms to emerge. The success of relations formed by reciprocal exchange is more sensitive to the presence of emotions. However, in order to develop a more comprehensive understanding of the actor in social exchange, one needs to consider more characteristics in addition to the rational, information-processing, reward-maximizing actor suggested by social exchange theory. For this reason, Lawler (2001) proposes the *affect theory of social exchange* which introduces an actor that responds emotionally to exchange. The main property of this theory postulates that joint activities among members of a group produce negative and positive emotions; they, in turn, shape individual-collective ties; the strength of these ties determines prosocial behavior within the group. This idea of emotions and social networks working together corresponds to my experimental design pretty well since I intend to shed more light exactly on how positive emotions operate in different social contexts (groups).

Analyzing the interpersonal relationships from a different scientific perspective, Becker (1974) adopted an economic and mathematical approach. The main concept of his analysis is "social income," or "the sum of a person's own income (his earnings, etc.) and the monetary value to him of the relevant characteristics of others, which I call his social environment" (p. 1090). Hence, people gain utility by redistributing part of their income to other members of the "family".

The concept of social connections or interactions with the others has been tested in laboratory settings as well. For example, Buchan et al. (2009) argue that large-scale cooperation (for example, global environmental issues) among people from different countries or geographical regions rises when a particular individual is considered to be more "globalized", thus, embracing more cosmopolitan than parochial motives. In fact, globalization creates two vital prerequisites for the emergence of social connections -sense of common belonging (we all face the same problems or settings) and familiarity (we know something about the others- they

are not perfect strangers anymore). Basically, the network of the “tribe” is enlarged on a global level, but it still embodies the same features.

Andreoni and Petrie (2004) tackle the question whether anonymity matters in public goods experiments. They find that the identification of the subjects and the information about their contributions increase the average level of endowments for the public good by 59% compared to the usual public goods experiment. Only when these two effects are combined, socially is optimal behavior highly encouraged. The experiment reveals another interesting result: information alone does not give rise to contributions relative to the control treatment, but identification alone has a slight positive effect. This finding suggests that the (quasi-)connection built through the received information about the other participants can lead to a behavioral change, as hypothesized in my experiment.

Another interesting study that deals with identity revelation effects is presented by Wilson and Eckel (2006). They look at the role attractiveness play when trusting strangers and find that people who meet certain beauty standards enjoy higher levels of confidence in a game involving trust and reciprocity. However, more attractive trusters tend to be subjects of higher levels of punishment as well – when they do not meet the expectations of the trustees. Hence, the authors suggest the existence of “beauty premium” and “beauty penalty”. Can this mean that the faces we choose to be our friends or acquaintances become more attractive to us throughout time or is it vice versa – we tend to include more attractive looking people in our social circle? Of course, the aim of this study is not to explore this relationship, but if it holds true, then one possible explanation why we trust attractive people more than others, and, eventually, why we want to make friends with them, could be related to, as Wilson and Eckel suggest, expression of good genes and a marker for social status. Whatever the reason, the authors stress on the importance of cognitive constraints, such as attractiveness bias, when it comes to decision-making and strategic behavior. Furthermore, this experiment shows that when the anonymity condition is violated, the outcomes can be very different.

Finally, the example of how emotional attachment and familiarity can achieve cooperation in small communities was showed by Ostrom (1990). She examined a few cases of small villages and how their members managed to maintain continuous commitment with low sanctions and high level of compliance. Long-term interaction and the resulting social relationships among the members created an emotional setting driven by the established social norms in which public shame was more effective than fines. This is the baseline that ensured the successful management of the common pool resources in these cases.

The evidence presented in this part let us summarize that the nature of social networks, their scale, and the dynamics of relations are capable of shaping pro-social behavior. If the characteristics of a network are changed or new ones are introduced, this may lead to a different behavioral outcome. Therefore, studying the way people connect with each other as a core feature of cooperation, is essential for understanding the mechanism at work.

Summary

Without pretending for complete awareness of the literature, I argue that my study can fill the following research gaps. First, most of the laboratory experiments so far focus on the negative emotional spectrum, whereas the positive emotions remain neglected. For sure, they could also predict cooperation or altruism, therefore, it is worth studying them. Second, the reactions of the participants in each experiment may vary, depending not only on the information they have about the other subjects, but also on the type of interaction they have with them outside of the experiment. Thus, bringing real social relations in the lab and studying them isolated from the compound social world, could allow us to arrive at more thorough conclusions about altruism and other types of pro-social behavior. Third, how the emotional responses change with respect to the inclusion of familiarity is another issue my experiment will attempt to address.

Methodology

The experiment's design

For the purposes of my study I developed a game theoretical lab experiment by recreating a classical economic game – the “Dictator Game”. The standard game consists of two subjects matched in pairs. One of them is assigned the role of the “dictator” and receives certain quantity of money from the experimenter. Then he or she has to decide how much to offer to the other subject, even if that amount is zero. The second player has no other option but to accept the offer. I chose this particular design, because it allows for “pure” altruism to take place, since, first, the “dictators” are normatively not obliged to redistribute anything from their earnings and second, they don't expect reciprocity to follow. This makes their pro-social behavior more “pure”, in a sense that it is not driven by any future benefits from the interaction with the other player while playing the game.

On the other hand, the prediction of classical economic theory that individuals are motivated solely out of self-interest and should keep all the monetary rewards for themselves should prevent any form of altruism to develop. Contrary to expectations, however, dictators do usually redistribute a certain amount. The estimates vary: for, example Forsythe et al. (1994; as quoted by Guala and Mittone, 2010) report that 20% of the endowments are redistributed on average, whereas Engel (2010) computes the mean for 616 treatments to be 28.35 %. Mueller (2003) looks at fairness norms as a form of voluntary redistribution. He cites Eichenberger and Oberholzer-Gee (1997) who, in a series of experiments, found that dictators give about one third of the cake to the other person. Two of the predominant motives supported as possible explanations by the literature are sense of fairness and concern about others' welfare (Guala and Mittone, 2010). In order to reduce the impact of these two stimuli, I introduce competition in my game. By doing so, I intend to isolate the effects of my two treatments, and if any changes occur, this should be more due to mood induction or familiarity than to inherent norms of equality and compassion.

For the purposes of my research, I recruited students from the University of Tampere to participate. The sample size I aim to reach should be between 50 and 60 subjects, considering the budget constraint and the availability of persons willing to take part. The active participation of more people is crucial in order to achieve robust results, because I investigate two different

treatments and compare them to the baseline. However, the proposed number of subjects is still not sufficient enough, and small sample bias should be taken into consideration, but these issues will be discussed in the Discussion section.

In the next few paragraphs I elaborate the experimental procedure. The participants are placed into four subgroups:

- control group – no emotional inducement, anonymity, participants are randomly matched;
- “emotional effect only” group - the subjects are exposed to the emotional framing, they do not know their partners, randomly matched again;
- “familiarity” group - everybody knows his or her partner well, but mood induction techniques are not used;
- ”emotions plus familiarity” group - the subjects will play against their friends, and emotional stimuli are used.

The experiment itself consists of six sessions with a different number of pairs in each session. The subjects enter two rooms that are separated by a wall but have a common door between them. Each individual is matched with another one from the second room. These settings allow the experimenters to watch the pairs, while the subjects cannot communicate with each other. First, the instructions⁴ are read aloud by the experimenter, clarifications are given, and questions are answered. Then the participants are asked to play a game similar to the one called ‘Memory’. Everybody starts simultaneously when the signal is given. They compete against each other to see who can find more quickly all the four pairs from a set of cards, lying face down on the desk in front of them. The experimenters observe them and write down the number of the winner from each pair. Then, depending on the results, the winners from the Memory game are assigned the role of dictator and the losers have to play as peers. The dictators receive 10 euros and have the right to keep them all or to redistribute something to the peers. Special sheets⁵ are handed out with the number of the other player, the role each participant has, and a blank space for the amount redistributed. Then the dictators make their decisions, the sheets are collected by the experimenters, and final payoffs are paid. They amount to a 5 euro show-up fee, plus the outcome of the Dictator game. At the end, each participant has to fill in a

⁴ For the Rules of the Game sheet, see the Appendix.

⁵ For the Game sheet, see the Appendix.

short questionnaire⁶, and the experiment is over. The entire procedure takes no more than 30 minutes.

One of the framing effects lies in the design of the cards they have to match⁷ in the Memory game. For the control group, these are simple, neutral images of everyday household objects. For the treatment groups, however, the images aim to provoke certain emotions such as happiness, joy, sense of belonging and friendship (for example: kittens and puppies, babies, happy faces, or friends having fun). When choosing the pictures, I used a picture database compiled by professional photographers, designers and psychologists in order to be sure that the visual message is universal and captures the desired emotions. Speaking of the effectiveness of such priming techniques, as Mayer et al. (1995) find, happy mood induction can further raise happiness among subjects, since usually people come to experiments in a good mood. In relation to that, by conducting this experiment, I put my own technique to the test whether it can be effective not only in provoking positive emotions, but also to create a genuine version of naturally occurring mood (Mayer et al., 1995).

As of the familiarity effect, the same images are used, but the only difference is that the participants are not randomly matched and they know their partner very well. For this part of the experiment, I ask everyone interested in my study to bring up a friend to play with. Those people who come for the “friendship” treatments will not be informed about the “anonymity” sessions held in different days.

Research methods and models

Epistemologically speaking, my approach is positivist in the way that it uses empirical data to support or refute a formulated hypothesis by using statistical and econometrical tools. Therefore, my method of analysis is strictly statistical. My analysis consists of two major parts:

1. Descriptive statistics and ANOVA test (or a t-test) for statistically significant difference between the subgroups.
2. Multiple regression models to analyze the impact of my treatment effects (the independent variables) on the dependent variable – the redistribution amounts, i.e. the altruistic behavior- while controlling for specific effects suggested by the literature.

⁶ For the Questionnaire form, see the Appendix.

⁷ The neutral and emotional images used in this experiment can be found in the Appendix.

My data collection process, i.e. the laboratory experiment, which details were presented in the previous part of the current chapter, means that I will compile my own set of primary data. The core unit of my analysis is the monetary amount redistributed by the dictator to the peer. The design of my experiment implies that I lose on degrees of freedom, since I obtain one unit of observation from two participants. Therefore, the statistics derived should be treated with precautions, since small sample bias should be taken into consideration. However, if there is any statistically significant effect in my study, the results from the analysis shall allow us to draw inferences in accordance with my hypotheses. I formulate them as follows:

1. The *null hypothesis* claims that there is no statistically significant difference in the treatment, i.e. the emotional framing does not contribute to an increase in altruism. Nor does friendship achieves higher levels of pro-social behavior.
2. The *alternative hypothesis* supports the statement that our intuitive or emotional attitude actually plays a significant role in deciding the personal amount of contribution to the community's sake. Furthermore, this effect is also strengthened by familiarity. This implies that there is a statistically significant effect in the treatment groups compared to the control group. I do not dare to hypothesize about the scale of the discrepancies between the two treatments prior to the experiment.
3. A third hypothesis can be formulated as a consequence of the alternative one. It states that emotions should have a bigger impact when the object of emotional projection or association is well-known to the subject.

Mathematically speaking, I hypothesize that the control group mean, μ_0 , should be smaller than the means of the two treatments (emotional framing and friendship), i.e. $\mu_0 < \mu_1$ and $\mu_0 < \mu_2$. Furthermore, the combined effect should be even higher, which means that $\mu_1 < \mu_{1+2}$ and $\mu_2 < \mu_{1+2}$. Moreover, not much can be said about the difference between μ_1 and μ_2 – we need to “let the data speak for themselves”. These two treatments embody completely different inducements which makes the outcome unpredictable. Nevertheless, it is worth finding out whether the individual mood or the social context furthers altruism more successfully. This opposition is also an object of the current study, along with the synergy between these two effects.

In order to test these hypotheses, I use the single-factor ANOVA test (also known as F-test) for the differences among group means. It is a reliable way to measure the effects of various treatments on specific subset from the sample by estimating the ratio between the variance

between treatments and the variance within treatments. The higher this ratio, the more statistically significant the statistic is. This means that the observed variance is in fact due to the factors used in the study. The reason why the F-test is preferred to a simple t-test when dealing with more than two groups is because it is independent of scaling error. This implies that it keeps the Type I error at the 0.05 cutoff regardless of how many times the test is being ran, which is not the case with a series of t-tests that will produce a cumulative error. Thus, one-way ANOVA test is a suitable statistical model for my study. Nonetheless, it is an omnibus test statistic and cannot provide any clue which particular groups differ from each other, only that at least two groups are different. Further post hoc tests are required to solve this issue.

The second part of my data analysis consists of a few regression models. I am interested in how my effects fit together with some other control variables proposed by the literature. My dependent variable is then the redistribution of money, Y_i , each dictator has given to the other player. The regression models looks like that:

$$Y_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_{1,2} X_{1,2} + \gamma_t \text{CONTROLS}_{n,t} + \varepsilon,$$

where α is the constant, $\beta_1, \beta_2, \beta_{1,2}$ and γ_t are coefficients to be estimated, and ε is the error term. X_1, X_2 and $X_{1,2}$ are the variables of interest, the emotional inducement, the familiarity, and the combined effect of the two respectively. All these three variables are coded as dummy variables. $\text{CONTROLS}_{n,t}$ is a n-by-t matrix of control variables with n rows (numbers of observations) and t columns (the number of control factors included in the model). The control variables I decided to consider in my model are the following:

- *Gender* – several studies point to a difference between sexes when it comes to altruism (Eckel and Grossman, 1998; Andreoni and Vesterlund, 2001). Again, I code this variable using dummies.
- *Education* – Frank et al. (1993) report that students on economics tend to be more selfish due to their exposure to self-interest models. A dummy variable is also suitable for this case. If the subjects study economics as their major they are coded with 1, and 0 otherwise.
- *Income* – I control for the socio-economic level each participant belongs to. The subjects have to place themselves or their families in one of the ten income deciles, thus, making this variable, an ordinal one.

- *Political views* – I use a ten point left-wing/right-wing scale to control for any differences depending on their political orientation, with 1, being extremely left-wing, and 10, being extremely right-wing.
- *Religiosity*- even though most of my subjects are international students, hence, coming from different denominations, religions or religious groups, the extent to which they consider themselves spiritual is of main interest here, and more precisely, do they observe the religious norms in a way that stimulates them to embrace pro-social norms and behavior (Donahue and Benson, 1995). For this control variable I use a 1 to 5 scale, with 1- atheist and 5- true believer.
- *Culture* – multiple studies (Roth et al., 1995; Henrich, 2000) outline the importance of cultural differences when analyzing cooperative behavior. In my study, the subjects will be asked about their nationality. Then I use Hofstede’s (2001, 2010) “Dimensions of National Culture” model⁸. Two of these dimensions can be implemented in my model. I group the countries of origin based on their “Masculinity versus Femininity” and “Individualism versus Collectivism” scores. The former distinguishes between more competitive and aggressive cultures, and more consensual and cooperative ones. The latter divides societies into individualistic and independent cultures, and into collectivist cultures with tightly-knit social connections. These two features will be included into two separate models in order to compare their goodness of fit. I argue that these variables provide an excellent classification of the subjects’ cultural backgrounds with regard to the purposes of my research. I code these two covariates with 1 for feminine or collectivist cultures, and 0 for masculine and individualistic cultures.

⁸ Methodology, data and any relevant information can be accessed at <https://geert-hofstede.com/national-culture.html>

According to the website’s rules, reference is made to the original sources.

Having a small sample, inevitably leads to bias in the coefficient estimates. Therefore, I do not dare to argue about any strict significance or generalizability. The logic behind running a couple of regression models is to observe how the treatments from my experiment fit together with some other variables discussed in the literature. The next section of the current work presents the results, interprets the statistics and provides possible explanations of the findings.

Ethics

Ethical concerns are crucial, especially when it comes to provoking and investigating people's emotions. I follow the general principles of the Declaration of Helsinki – autonomy (informed consent); beneficence; non-maleficence; justice; anonymity. The participation will be entirely voluntary with an informed consent of the subjects⁹. The entire experiment will be completely anonymous, i.e. no personal data is required to be collected or stored that may reveal the identity of the participants. In terms of beneficence, I argue that a better understanding of how our mind works in its entirety is vital for the development of social sciences. Since feelings are very sensitive and personal topic, I focus on provoking only positive emotional responses without any risk of causing harm or deceiving the subjects.

⁹ For the Consent form, see the Appendix.

Results and Discussion

In this section of the current work, I present the findings suggested by my experiment. I organize this chapter in four separate parts. First, I provide some descriptive statistics and comment them. Then I look at the results from the t-test and ANOVA. The third part deals with some regression models and addresses the issues associated with them. The final part, the discussion, provides explanations, comments on the difficulties and the shortcomings of the study and makes suggestions about future work.

Descriptive Statistics

The experiment took place in the campus of University of Tampere (UTA). Six sessions with different number of participants were conducted in March 2017. Most of the subjects were Bachelor and Master degree students from UTA, but also students from the other two universities in the city – Tampere University of Technology (TUT) and Tampere University of Applied Sciences (TAMK). Eight high school students also participated in one of the sessions. The recruitment was done using the e-mail list of the international students' community at UTA. Some participants were reached by posting in social media websites, and a special event was created in Facebook. Another group of subjects (especially for the friendship treatment) was contacted using personal social networks and word of mouth. The entire recruitment period took two weeks of intense communication.

In total, seventy people participated in my laboratory experiment, which makes 35 pairs and 35 units of observation. This is due to the feature of my design – the dependent variable of interest is the part of the endowment redistributed by the dictators to the peers. Speaking of demographic characteristics, the age of the participants is between 18 and 26 years old, 57% of them are female. All of them come from very different majors – mostly humanities, computer science, media, education, and engineering¹⁰. Only five persons reported that they study economics or business. A vast majority of them were unfamiliar with this kind of experiments. Their cultural backgrounds are very diverse as well: international students from all over the world were recruited. However, I can identify two subsamples of people with the same

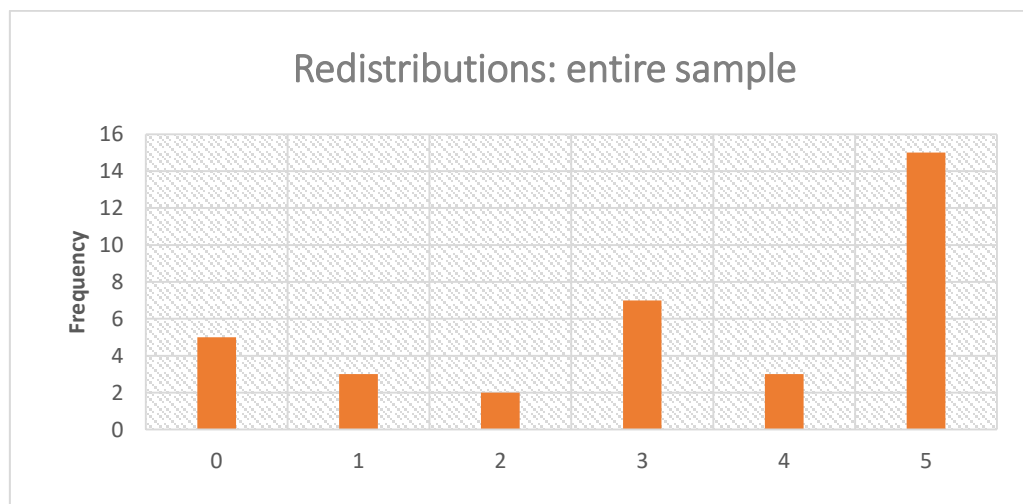
¹⁰ 8 subjects had a high school education.

nationality: 8 Korean students and 16 Finnish university and high school students. These two groups are dispersed among the different treatments.

The average payoff earned by all the participants is 10,70 euros. For their part, the peers earned 8,66 euros on average, whereas the dictators (as expected) left the lab with slightly more money – 11,81 euros. This final payoff contains both the show-up fee and the outcome of the Dictator game.

The main variable of interest in my study is the redistribution amount. The sample mean is equal to 3,19 euros (SE: 0,322) with a standard deviation of 1,91. The range is 5 with a min=0 and a max=5. The median is 4 and the mode is 5, which means that the distribution itself is left-tailed (Skew[X]= -0,496). This is visible from *Graph 1*:

Graph 1: Sample Histogram

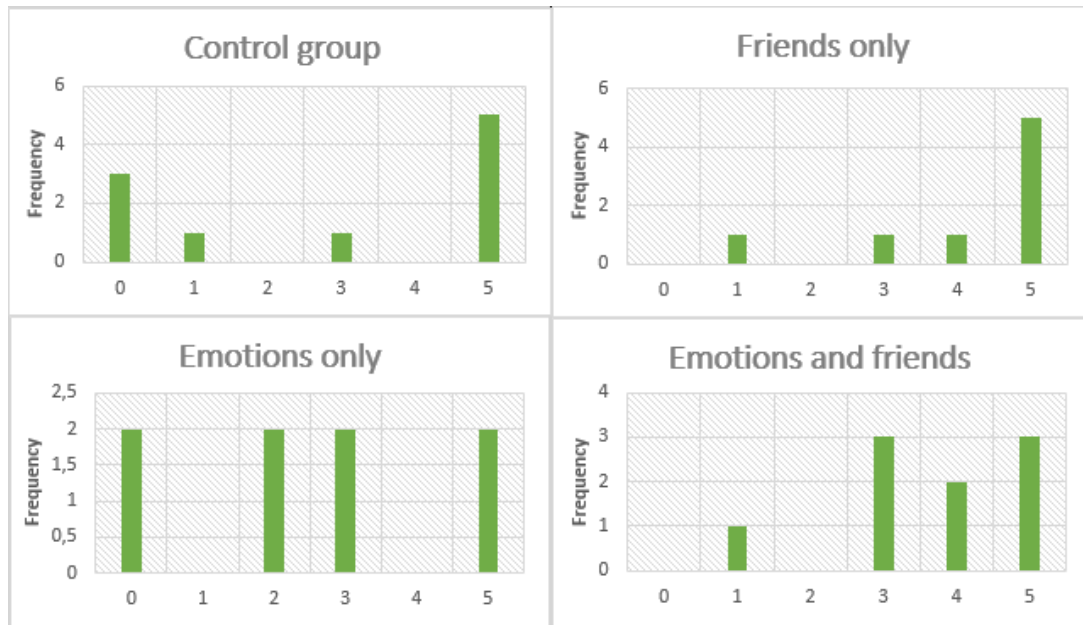


The histogram confirms the descriptive statistics' parameters. The distribution is concentrated on the right side around 3, 4 and mostly 5. The median values 1 and 2 exhibit the lowest frequency, whereas there is a slight peak at 0. Since the sample is rather small it is worth looking at the kurtosis in order to identify outliers that may influence the analysis. In our case, $Kurt[X] = -1,268$ which is less than the kurtosis of the normal distribution ($Kurt[X] = 3$). Therefore, one might argue that this distribution is *platykurtic*, i.e. it produces fewer and less extreme outliers. Overall, the data in my sample does not follow a normal distribution which means that statistical inferences regarding the population should be taken with consideration¹¹.

¹¹ The shortcomings of the sample will be thoroughly discussed in the following sections.

The next step in our analysis is to take a closer look at each treatment separately to identify any trends with regard to the effects we are interested in. *Graph 2* shows the histogram of the four groups in my sample: the control group; the group with positive images and anonymity; the group with friendship and neutral images; the group that combines these two treatments.

Graph 2: Histograms of the treatments



The control group exhibits a U-shaped distribution with more observations on the two extremes. The observations in the Emotions treatment form a uniform distribution without any particular pattern. The two treatments that involve familiarity, however, are both skewed to the left, thus, following the distribution of the sample (or the sample distribution itself is shaped by the effect of these two treatments). Again, we observe a cluster around 5. Interestingly, nobody decide to give nothing (0 euros) to the other person in the friendship treatments as opposed to the other two treatments.

The average contribution per treatment reveals some intriguing results. *Table 1* summarizes the descriptive statistics for each group in the sample. The control group (the baseline case) mean is highly consistent with previous experiments discussed in the *Methodology* chapter. The “friendship” treatments have considerably higher means than the “stranger” treatments which proves my hypothesis that introducing social networks will have a positive impact on altruism.

The positive emotions, though, seem to have, in fact, a negative effect on redistribution in contrast to what was anticipated. The means for the two treatments are lower than their counterparts, if we compare “strangers” to “friends” treatments. This implies that the emotional inducement technique did not manage to achieve higher levels of pro-social behavior in my experiment. Without running any tests, one could argue that the alternative hypothesis should be rejected in favor of the null hypothesis. In light of that, more comprehensive analysis of this issue will be presented in the next section.

The medians are higher than the means (except for the Emotions treatment) which confirms the left skewness observed on *Graph 2*. The modes, excluding the Emotions group again, are the same for the other three treatments and equal five, which is also the maximum amount redistributed in my sample. This means that the subjects showed the inherent sense of fairness discussed in the literature. What matters here is that in the “friendship” treatments, the numbers gather around the 50-50 partitioning in comparison with the other two treatments. The argument is strengthened by the evidently lower standard deviations presented in the fourth column.

All this taken into account – higher means and medians, modes = 5, and less variance – leads us to the claim that friendship did trigger more pro-social behavior and sense of fairness. As of the positive emotions, the results are controversial.

Table 1: Summary of redistributions: control group and main effects

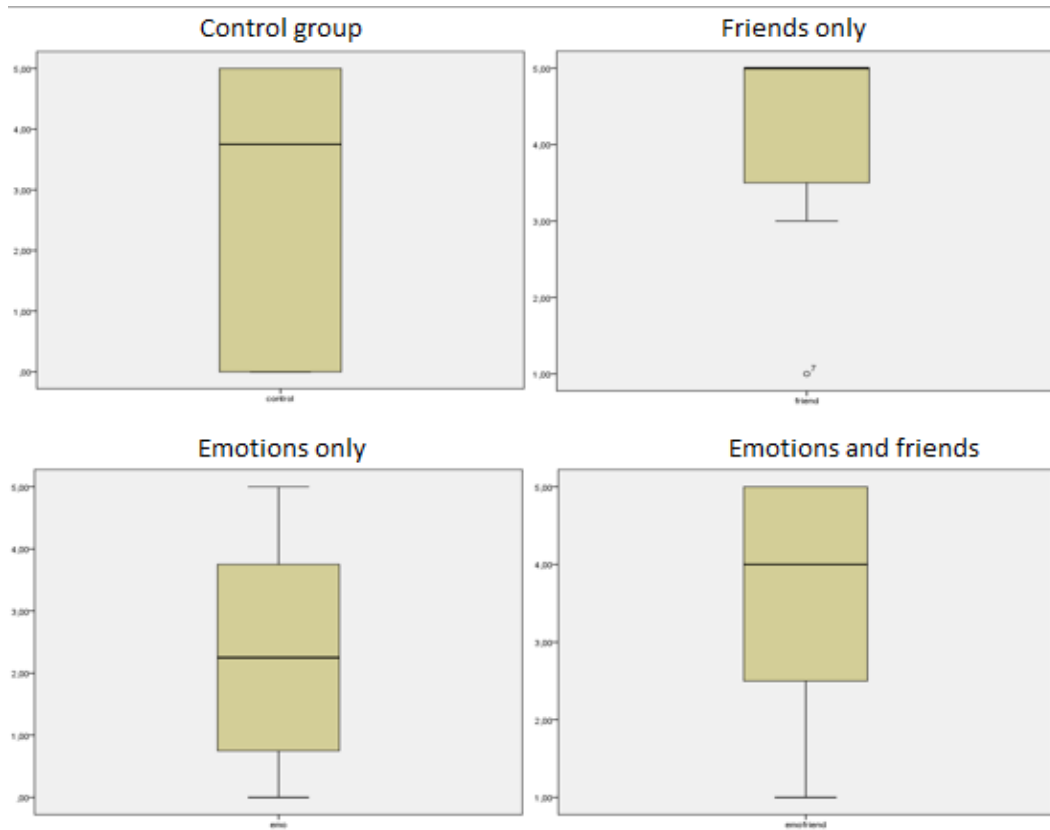
Summary of redistributions					
<i>Treatments</i>	<i>Mean</i>	<i>Median</i>	<i>Mode</i>	<i>SD</i>	<i>N</i>
Control	2,85	3,75	5	2,381	10
Emotions	2,31	2,25	0/2,5*	1,926	8
Friends	4,13	5	5	1,458	8
Emo+Friends	3,5	4	5	1,436	9
Total:					35

* both values appear most frequently

In order to examine these four sets of data and their distributions graphically, box plots are shown below. Again, the higher medians indicate the effect when familiarity is introduced. The two graphs on the right depict the left skewness of the distributions. In each group there is

one outlier: two of the dictators decided to redistribute only 1 euro. In general, these two box plots complete the histograms presented in *Graph 2*.

Graph 3: Box plots



The Emotions group appears to be more normally distributed. Yet this may be misleading, since the distribution is clearly uniform and the box plot does not account for that. Similarly for the baseline, where most of the data is grouped near the tails. Nonetheless, the box plots are useful to compare the differences between the four treatments, rather than to serve as a source of evidence for their distributions. It becomes clear that regardless of the outliers in the friendship treatments (and because of the small sample their relative weight is considerable), the two medians are higher and most of the data is visibly clustered near the maximum (5 euros). Apparently, there is an effect which statistical significance must to be tested. In the next section, I run different statistical tests regarding my hypotheses, and comment on the results and on the rationale behind using exactly them. To sum up, the descriptive statistics provided us with very interesting results and a few questions to be answered in the coming pages. Furthermore, they shed light on the peculiarities of the data that need to be taken into consideration when drawing inferences from this sample.

Hypothesis testing

In this section, I present the results from the hypothesis tests I decided to run. Again, my hypotheses state that: first, positive emotions do increase pro-social behavior; second, familiarity matters when it comes to altruism; third, these two effects combined should produce synergy and lead to even higher levels of contribution. Since I have four groups, the design of my experiment suggests that an ANOVA test is an appropriate way to test the significance of these effects. However, this requires the sample to be divided into four parts with less than (or equal to) ten observations in each of them. *Table 2* reports the result from the ANOVA test:

Table 2: ANOVA: single factor test

ANOVA: Single Factor						
<i>Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between	15,17410714	3	5,058035714	1,446903	0,24813	2,911334
Within	108,36875	31	3,495766129			
Total	123,5428571	34				

The p-value is dramatically bigger than the 5% cutoff which makes the statistic insignificant. Nevertheless, this does not immediately imply that there is no effect whatsoever.

One can speculate that it is rather due to the fact that the model loses on power because of the few observations in each group. To account for this possibility, we need to change the structure of the data in order to gain more degrees of freedom. I do this by joining the two “friendship” treatments together, on the hand, and then merging the two “emotional” treatments, on the other. Ultimately, we obtain two major groups to compare using a standard t-test. It is acceptable to do so, if there is no statistically significant difference between the two subgroups that are being combined. And this is exactly the case with the two “friendship” treatments. However, the p-value for the t-statistic, when the two “emotional” treatments are compared, is significant at the 10% cutoff. This difference is mainly attributable to the presence of familiarity in the second “emotional” subgroup. Even if we merge them and run a t-test without relating to this problem, there is no statistically significant effect caused by the emotional inducement. All this being said, we can refute the alternative hypothesis and accept

the null hypothesis which states that positive emotional framing does not lead to higher levels of altruism.¹²

As it became clear from the mean differences in the previous section, familiarity undeniably increased the average redistribution. *Table 3* shows the result from the t-test when the two “friendship” treatments are compared to the other two treatments, which I call “stranger” for simplicity, regardless of the emotional inducement.

Table 3: T-test for “Friends vs. Stranger” case

t-Test: Two-Sample Assuming Unequal Variances		
	<i>Stranger</i>	<i>Friend</i>
Mean	2,611111	3,7941
Variance	4,604575	2,0643
Observations	18	17
Hypothesized Mean Diff.	0	
df	30	
t Stat	-1,92609	
P(T<=t) one-tail	0,031808	
t Critical one-tail	1,697261	
P(T<=t) two-tail	0,063615	
t Critical two-tail	2,042272	

Since I hypothesize an increase in altruism, it is more accurate to look at the one-tail p-value which is equal to 0,031806, and thus, the statistic is significant at the 5% level.¹³ This implies that the null hypothesis should be rejected in favor of the alternative one – the introduction of familiarity in my experiment does stimulate pro-social behavior, resulting in more redistribution.

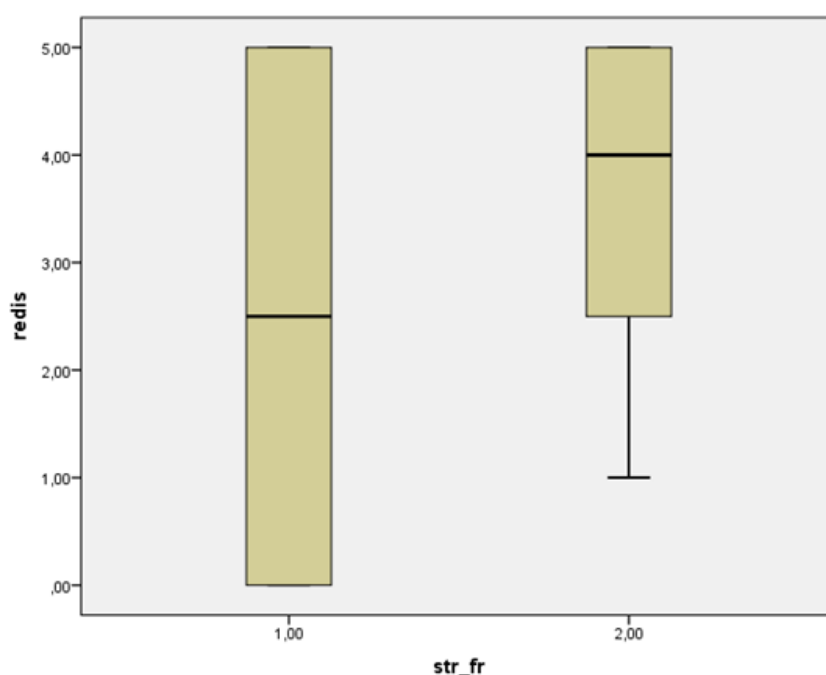
Of course, before accepting these results, one should question the reliability of the test itself. The t-test comparing the means of two independent samples has to meet three major assumptions: independence of the data; equal variances; normality.

¹² The matter with the emotions and the direction of the means will be addressed in the Discussion part.

¹³ The two-tail test remains highly significant at the 10% cutoff, but the one-tail critical value responds better to my hypothesis.

The first conditions is met because each unit of observation is sampled independently from the others. The second condition is not violated for two reasons. First, if the two sample sizes are equal, this makes the Student's t-test robust to the presence of unequal variances (Markowski and Markowski, 1990). Second, I use a modified version of the original t-test that accounts for the disparity of the variances. The third condition, however, requires the use of a normality test. Even though the t-test is robust to small and medium deviations from these three assumption (Bland, 1995; p.166), I argue that the check for normality is necessary, since we deal with a very small sample and, therefore, need to be careful for misleading results or biases. Whether the two samples follow a normal distribution, can be tested either graphically using normal quantile plot (Q-Q plot) or running a normality test such as Shapiro–Wilk or Kolmogorov–Smirnov test, both available in SPSS. The following *Graph 4* shows the box plots of the two categories (samples).

Graph 4: Box plots - “Strangers vs. Friends” case. 1=”Stranger”; 2=”Friend”.



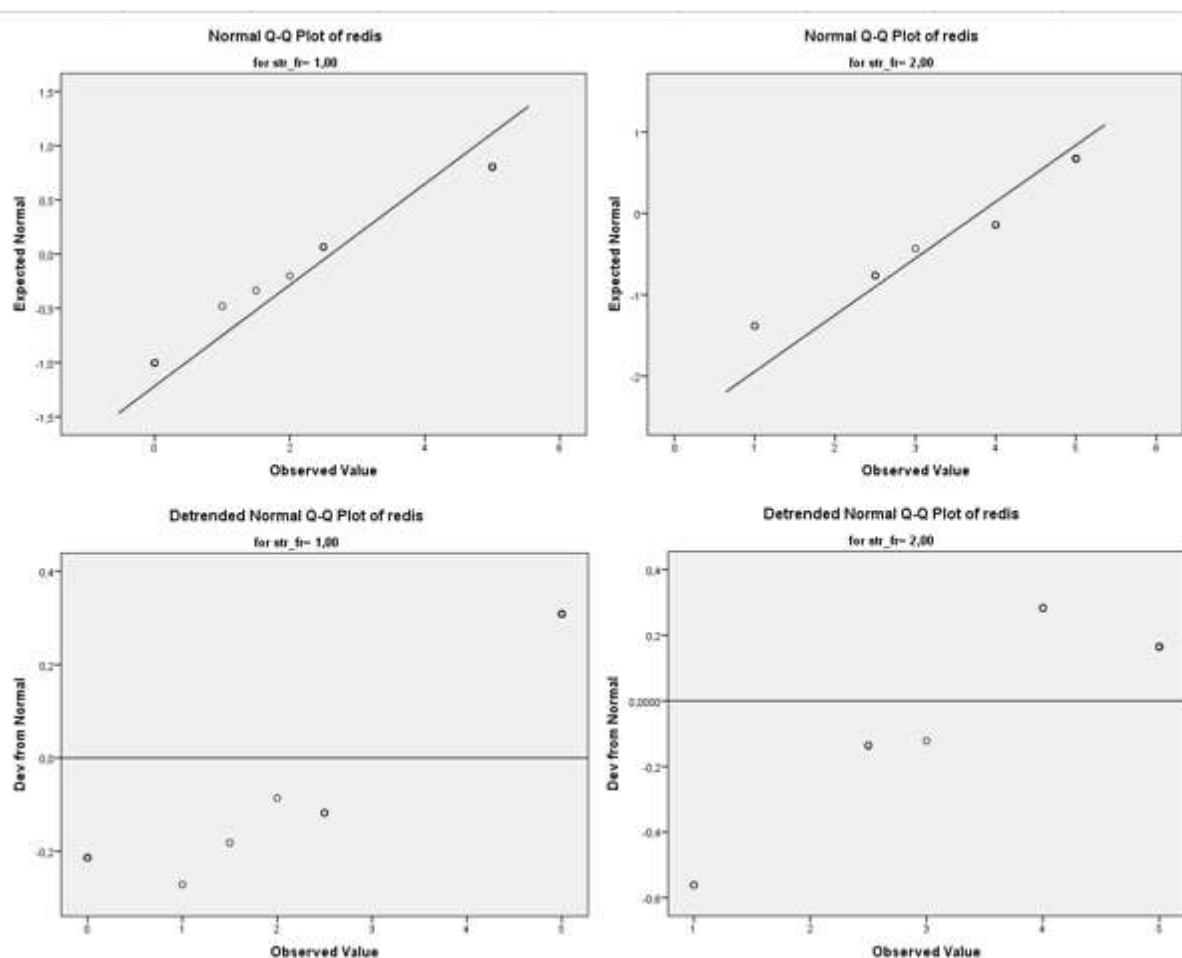
The blox plots suggest that the two distributions are not only different from each other, but that they do not follow the normal distribution. In the “stranger” case, the distribution has a W-shape, whereas the distribution of the “friend” group is obviously skewed to the left¹⁴.

¹⁴ This statement is based on the histograms presented in Graph 2. A new histogram is not shown to avoid redundancies.

Additionally, the box plots reveal the impact of familiarity on the redistribution amounts: the median for group 2 is substantially higher than the one for group 1 (approximately by 1,5 euros).

The next graph depicts the actual Normal Q-Q plots that compare the *observed* data with the data we *would expect to see* if they were normally distributed. The solid line represents the normal distribution. Any points that stray far from the line tell us that the normality assumption is violated. The Detrended Normal Q-Q plot is another version of the same concept, but it shows the magnitude and the direction of deviation with reference to the normal distribution expressed by the horizontal line.

Graph 5: Normal and Detrended Q-Q plots. 1="Stranger"; 2="Friend".



Even though the deviations from the normal distribution are not very large for both groups, we observe on the Detrended Normal Q-Q plot for group 1 that there is a negative trend in the direction of the deviation. Thus, the graphs suggest that the use of a normality test is advisable in this case.

When dealing with small samples any outlier or deviation from the normal distribution should be taken cautiously, therefore, I present the results from two normality tests in order to account for that.

Table 4: Normality tests. 1="Stranger"; 2="Friend".

Tests of Normality							
		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	<i>str_fr</i>	<i>Statistic</i>	<i>df</i>	<i>Sig.</i>	<i>Statistic</i>	<i>df</i>	<i>Sig.</i>
<i>redis</i>	1,00	,256	18	,003	,807	18	,002
	2,00	,270	17	,002	,800	17	,002

a. Lilliefors Significance Correction

Table 4 shows the results from Kolmogorov-Smirnov (K-S) and Shapiro-Wilk (S-W) test. Both tests are highly significant at the 1% cutoff which is a serious argument for a violation of the normality assumption. Certainly, the p-values suppose, but does not prove that the data is not normally distributed, in reality. For example, the S-W test is extremely sensitive to minor deviations even for large samples. That is why the scientific background of the study and the researcher's own judgement should be regarded when deciding on the significance of these tests.

I argue that there is enough evidence to conclude that the data do not follow a normal distribution. First, the p-values are drastically smaller than the 0,05 alpha level. Second, the two tests do not contradict each other. Third, the Q-Q plots distinctly show the deviations and their magnitudes and direction. Fourth, the histograms from the previous section also suggest that. Consequently, even though the t-test is robust to all but large violations from the three major assumptions (Bland, 1995; p.166), the statistic should be interpreted carefully because of the small sample bias. Therefore, in order to be more precise, one could run a permutation (randomization) test to confirm the results. This type of test creates quasi-distribution of sample mean-differences by replacing each value from the real sample with another actual value. Then the actual mean difference (or the estimated t-statistic for it) is compared to the quasi-distribution of mean-differences (all possible alternative treatment assignments) in order to reject or accept the null hypothesis. The advantages of this randomization test is that it is non-parametrical and the statistic is not obtained from a theoretical distribution, which means that it does not need to satisfy the same conditions. Furthermore, the test is useful when dealing with

very small samples and with unbalanced designs, i.e. unequal number of observations in each subgroup or sample. However, even though it might be useful, I do not consider running permutation tests for the purposes of the current analysis.

Regression models

Even though regression analysis is the most preferable statistical tool when dealing with laboratory experiments that involve small samples, I decided to investigate how my treatment effects fit into a broader model including a few more control variables listed in the Methodology section. The reason why I am interested in running such linear models is because pro-social behavior often depends on multiple factors such as socio-economic status, religious views, cultural background and education. All these variables form the personality of each individual which, in turn, impacts the decision-making process in my experiment.

I ran many models, but here I will present and comment the one with the best model selection criteria¹⁵ relative to the other ones. The output from the regression analysis is presented in *Table 5*.

Table 5: Generalized Linear Regression Model

Generalized Linear Model (robust estimates)							
Parameter	B	Std. Error	Confidence Interval		Hypothesis Test		
			Lower	Upper	Square	df	p-value
(Intercept)	1,981	1,5990	-1,153	5,115	1,535	1	,215
friend_dummy	1,357	,6195	,143	2,571	4,799	1	,028
[gender=1,00]	,037	,5396	-1,021	1,094	,005	1	,946
[gender=2,00]	0 ^a						
[edu=,00]	1,182	1,3458	-1,456	3,820	,771	1	,380
[edu=1,00]	0 ^a						
[cult_fem=,00]	1,555	,6345	,311	2,798	6,003	1	,014
[cult_fem=1,00]	0 ^a						
income	,029	,1565	-,278	,336	,035	1	,852
polit	,045	,2049	-,356	,447	,049	1	,824
relig	-,662	,3478	-1,344	,020	3,621	1	,057
(Scale)	2,169 ^b	,5185	1,358	3,465			

Dependent Variable: redis
Model: (Intercept), friend_dummy, gender, edu, cult_fem, income, polit, relig
a. Set to zero because this parameter is redundant.
b. Maximum likelihood estimate.

¹⁵ I use Akaike Information Criterion (AIC). The model presented in this part is the one with the lowest AIC value compared to all other models.

There are seven explanatory variables in my model. First, the variable of interest is coded as *friend_dummy*. This is a dummy variable that takes the value of one if a single case comes from the “friendship” treatments and zero otherwise. As expected, in another model the dummy variable for emotional against neutral treatments appeared to be non-significant. The control variables in the model are: income, political views, religiosity, gender, education. As of the cultural background, the best fit was achieved when the covariate for masculine/feminine cultures was included¹⁶. Other culture variables, such as a dummy variable for Finland and another one for South Korea¹⁷, and the collectivist/individualistic societies, produced higher AIC values and were discarded.

Most of the coefficients lack statistical significance and that is why they are not worth commenting. However, religiosity is on the verge of the 0,05 alpha level, and culture seems to be significant, too. From the estimates in my model it is visible that deeper religious views are associated with less altruism. On the other hand, participants from more masculine (more selfish and competitive) cultures redistributed more compared to those who belong to more feminine ones. These two results contradict my initial hypotheses about these control variables. As pointed out in the literature, religious norms should inspire pro-social and altruistic behavior, whereas people from more collectivist and feminine cultural backgrounds should care more about equal distribution of goods.

The independent variable of interest, though, is also significant at the 5% cutoff ($p=0,028$). Dictators who were placed in the “friendship” treatments gave 1,357 euros more on average showing the strong effect familiarity has on redistribution.

The results shown in *Table 5* should be interpreted carefully. Four of the coefficients tend to be insignificant which leaves no space for speculations. Yet the p-values for culture and religiosity suggest that there is a statistically significant effect, even though it is the opposite of what has been hypothesized. With only 35 observations it is reasonable to think that these estimates are biased and more investigation (i.e. a larger sample) is needed to draw reliable statistical inferences. However, the explanatory variable of many interest does not lose on statistical significance and the regression analysis confirms the hypothesis tests discussed above. A power analysis could be appropriate in order to estimate the sample size required to obtain significant coefficients for these independent variables. For now, I argue that this model

¹⁶ Feminine cultures are coded as 1. For more information, refer to the Methodology section or Geert Hofstede’s webpage.

¹⁷ Eight of the participants are South Korean which required the inclusion of such variable.

cannot tell us much about the above mentioned effects and I will base my further interpretation of the main effects in my experiment on the statistical evidence derived from the t-test.

Discussion

From the statistical analysis, it became clear that the two main treatment effects considered in my experiment have an opposite influence over the decision to redistribute in the dictator game. Despite being not statistically significant, positive emotions led to a decrease in the average donations made by the dictators regardless of the social context, whereas familiarity has a very strong impact on altruism. Referring back to my initial hypotheses, friendship did perform as expected – the participation of a member from the social network to which the dictator belongs matters substantially. Positive emotions, on the other hand, failed to stimulate higher levels of pro-social behavior and, therefore, the null hypothesis cannot be rejected. Although the mean difference between the emotional and neutral treatments loses on statistical significance, the results are still intriguing and deserve attention. The notion that positive mood can cause less concern about the well-being of the others is worthy of further investigation.

For this part, I intend to adopt an inductive-deductive approach when discussing the results from my research. In order to do so, I will present explanations coming from the subjects themselves, and then look at them and at the results from the perspective of some social and psychological theories and studies.

During the last of phase of the experiment, the participants were asked to fill in a short questionnaire. After the demographics questions, which served as control variables in my regression models, the subjects had to write a few sentences concerning the outcome of the game. The dictators were asked to explain their decision, while the peers had to answer how they felt after they had seen the outcome. I will sort their answers into different themes and report the frequencies at which they occur. This information is valuable because it will reveal whether the participants were aware of the treatment manipulations in the experiment and thereby being biased in their actions. Furthermore, this approach will allow us to explore to what extent the behavior of the subjects is consistent with what we already know about altruism or cooperation, on the one hand, and the role of emotions in social interaction, on the other.

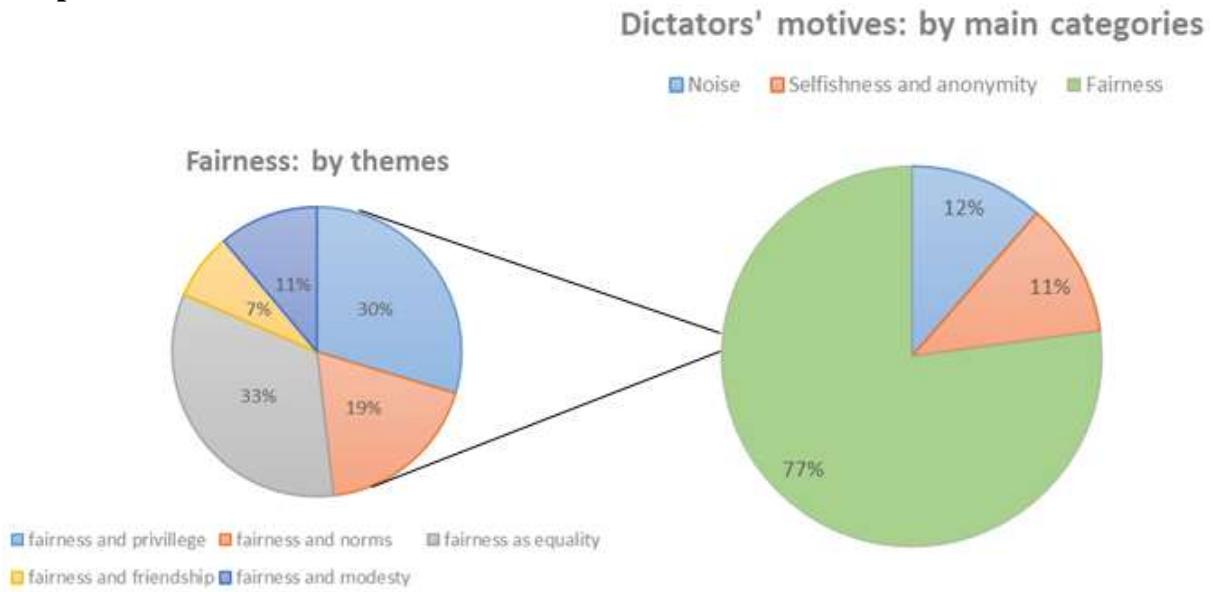
The final step in this discussion is a commentary on the limitations of the current study and further research on the same topic. Some features in the design and the sampling process

could be improved in order to obtain more robust results. Of course, this raises questions not only about the current stance of my research, but also regarding some possible directions for a future work.

Subjects’ self-reports

It turned out that the dictators provided very intriguing justifications of their decisions. I extracted the main points from their answers and systematized them in a couple of themes that form three major categories. The graph below summarizes the findings.

Graph 6: Dictators’ motivation



The three main categories I would like to outline are: “noise”, “selfishness and anonymity”, and “fairness”. In the “noise” category I included four cases¹⁸ that do not fit in any of the other categories or themes and that are basically random. For example, one of the subjects admitted that she acted that way simply to tease her friend.

The second category called “selfishness and anonymity” consists of four cases as well. Interestingly, these answers came only from those people who redistributed nothing and all of them were placed in the “stranger” treatment groups. They justified their actions to give zero euros because of two reasons: first, they felt privileged to take the entire cake because they were the winners; second, since they did not know the other person, this incentivized them to act selfishly. Therefore, we can conclude that the motivation behind selfishness in my experiment was driven by two factors: the competitive nature of the game and the anonymous settings.

¹⁸ One of them is missing data.

The former was sought as an outcome because by introducing competition, I intended to negate the inherent sense of fairness that people and then build up on that by means of my treatment effects. The latter has a curious counterargument in the ‘friendship’ treatments: two of the subjects stated that the fact that they played against their friends influenced their decision.

The predominant category in my sample (77%) is called “fairness”. The reason why I chose that word is straightforward – all of the participants who fall in this category used the words “fair”, “just”, and “equal” in the same sentence. However, the term “fairness” is pretty broad, therefore, I divided it into a few themes. The pie chart on the left shows how “fairness” is broken into subthemes. As we can see, there is an interesting divide among the dictators. 33% of them perceived fairness as equality, meaning that only a 50/50 split (or close to that) is fair and right. 30% of the subjects, though, believed that it is fair to keep more than the half, but still give something to the other person. This important finding sheds more light on how people react to hierarchy and what decisions they make when they are entitled – for some of them the victory meant nothing, for others it was important to distinguish themselves from the loser in terms of the final payoff.

The third theme that occurs at 19% frequency is “fairness and norms”. These five subjects admitted that keeping all for yourself is not a justifiable behavior and that they do not want to be seen as “bad persons”. Furthermore, they explained that if they were completely selfish or gave too little, this would have made them feel “bad” or “sad”. What we observe is the understanding of fairness with regard to good social behavior and clear conscience.

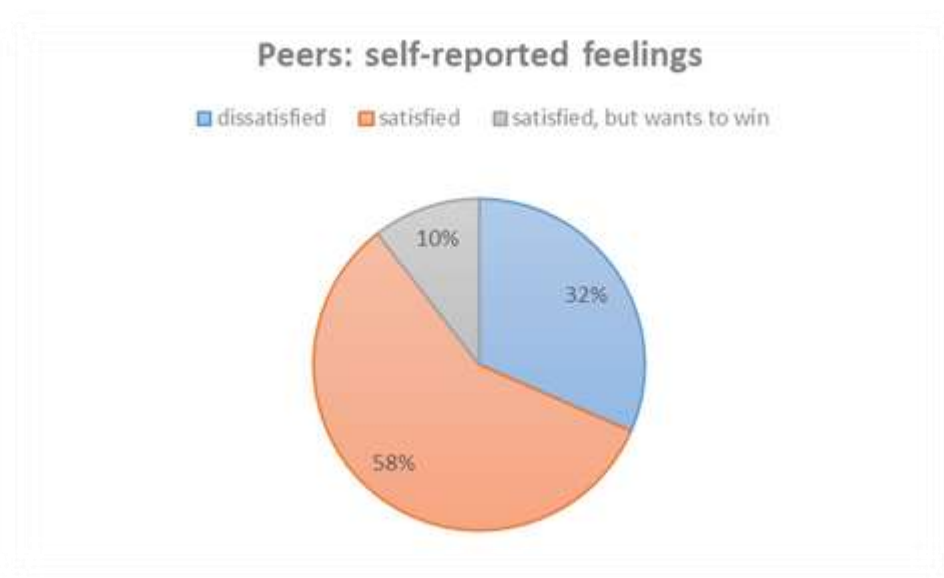
The last two themes have five persons all together. As I mentioned above, one of them is the “fairness and friendship”, meaning that, according to the respondents, one should treat one’s friends fairly. The other theme is “fairness and modesty”- some of the dictators believed that they won by chance since everything happened so quickly. Therefore, they thought that since both players put the same effort, the winner does not deserve to take more and that is why these dictators gave 5 euros.

As of the peers, they had to express their feeling after the game. The way this group of subjects accepted the outcome of the game can give us some insight into how they understood the terms “equal”, “fair”, and “privileged” while being in the other position.

Graph 7 shows that more than the half of the subjects seem to be satisfied with the outcome. They accepted the decision made by the other player. In the cases where 5 euros were distributed, the peers described this as fair or were surprised by the generosity of the dictator.

When they received less than 5 euros, but more than 2 euros, their judgement of the situation was positive again, because it is acceptable to keep a bit more if you have won the game.

Graph 7: Peers' reactions



On the other side of the emotional spectrum, one third of the subjects were disappointed from the result. It is important to notice that their dissatisfaction does not come entirely from the small payoff they received at the end – a situation they deemed “unfair”- but also because they wanted to perform better and to win the game. Even though some of them were given 5 euros, the competitive attitude prevailed and made them leave the room dissatisfied. One might speculate that if the payoff were considerably higher, their mood would be different. Only two of the peers felt happy with the outcome, but still wanted to be the winner. However this does not change their overall satisfaction leaving them somewhere the two major groups.

After the analysis of the participants' own responses, one issue deserves additional attention. Some of the subjects in the “friendship” treatments noticed the presence of their friends in the other room and recognized it as an influential factor that contributed to their decision-making¹⁹. Yet none of them seemed to reflect on the positive emotional inducement. On the one hand, this is desirable because when framing is used, it is crucial for every study's success that the subjects are completely unaware of any kind of manipulation. On the other hand, we cannot be sure that they noticed the “message” on the cards and that they connected this emotional stimulus with the second phase of the experiment – the Dictator game- when the

¹⁹ After the experiment finished, I was asked by some of the subjects about their friends' presence and how this will distort my results.

altruism is measured. This problem will be thoroughly discussed in the next two parts of the discussion section.

Theoretical explanations

In order to provide a better grasp of what has been found in my study, it is worth investigating how some well-established theories and models present in the literature explain the results of my experiment and the personal motivations reported by the subjects.

First let us discuss some theoretical concepts with respect to the justifications given by the participants regarding what is deemed just and fair. As we saw in the literature review, fairness is a key concept in public goods games, cooperation and altruistic behavior. I can identify two concepts that can clarify the rationale behind their decisions.

Some of the subjects clearly expressed the opinion that it would make them feel bad to keep all the money, that they want to make the other player happy, that they want to be perceived as good persons, that they felt it right to give. The design of my experiment allows for this pure altruism to take place. This means that people do not gain any utility from giving, they just do it for the sake of the others. However, this might not be the case, as Andreoni (1990) pointed out. His concept of impure altruism, called “warm glow giving”, can serve as a possible explanation of the motives reported by some subjects. It were also their emotional stance and their conscience they considered when deciding the redistribution amount. This dual nature of altruism will be discussed later.

As already noted, a considerable majority of the subjects used the words “fair” and “just” in their answers. Of course, this sounds very similar to the Rawlsian concept “Justice as Fairness” (1971). According to this paradigm, fairness is achieved through equality, and justice is a consequence of a fair agreement. Actually, the subjects in my experiment followed these principles when resolving the “redistribution dilemma”. Moreover, this particular behavioral pattern can be observed among the dictators from the “stranger” and among those from the “friendship” groups which reveals how the “veil of ignorance” works in practice. Fairness is a universal concept that does not distinguish based on previous or subsequent interactions, and it occurs in the anonymous treatments quite frequently.

All this being said, it seems that it is not an easy task to completely negate the effect of the inherent sense of fairness human beings possess, even in the presence of competition. This

social mechanism, as Binmore (2009) argues, has evolved naturally and lies in the foundation of our evolution as a social species. He writes:

“If I am right, this deep structure of fairness is written in our genes, and hence is universal in the human species.”

Apart from the motives the subjects shared at the end of the experiment, I would like to change the course of this discussion by focusing on the results obtained from the data analysis. Let us begin with the statistically significant factor – friendship – and then move on to some plausible scenarios that could explain the lack of any impact of positive emotions on redistribution.

Drawing on the findings from my study, it seems that the kind of social interaction can determine, if not the occurrence, at least the magnitude of prosocial behavior, i.e. people decide how much altruism to “invest” depending on the social context. Hence, it is reasonable to look for theoretical justifications among different social theories. There are three major theories I consider in that case: social exchange theory, social norms, and social evolution.

The main assumptions of *social exchange theory*, as defined by Lawler and Thye (1999), embrace a more economic approach and, thus, resonate with rational choice theory. They postulate that individuals are self-interested and strive to maximize gain, whereas the relationships they engage in are interdependent. Homans (1974, cited by Cook and Rice 2001), who is one of the main developers of the theory, defined individual self-interested behavior as a unity of economic (external) and psychological (internal) needs. As for the essence of the relationships, they resemble market behavior in a sense that people assess costs and rewards from the interaction with the others, and also rank the alternatives (Homans, 1958).

Furthermore, Homans (1958) points out that the more value a person expects to receive from a group or a single person, the more value he or she is willing to give to this particular group or person. Put another way, how much the interaction with another human being is valuable to us impacts how much altruistic we want to be. Additionally, the net worth from the interaction is determined by its dependent nature, i.e. the approval of the others is needed. For their part, approval and trust are built over time, meaning that giving (cost) today actually creates an indirect benefit from a long-term relationship. Nye (1982, pp. 20-21, cited by Yaffe et al. 2006) suggests twelve propositions that facilitate the understanding of social exchange. For the purpose of my study, however, especially interesting appears to be Proposition 4 that states:

“Immediate outcomes being equal, they choose those alternatives that promise better long- term outcomes.”

According to mathematics, five euros are more than four and three euros is more than only two. According to orthodox economics, more is always better than nothing. Nonetheless, what if the dictators reckoned all alternative payoffs from the game (immediate outcomes) being equal? This may happen when the cost of giving one additional euro to the other is considered negligible compared to the long-term benefits from friendship. That is why the subjects who played against their friends gave more on average. They value the higher gains from the relationship and are willing to provide more, as opposed to the case when they have to play against anonymous opponent. Since the dictator knows nothing about the peer, he or she is uncertain about the potential benefits in long-run, and therefore choose immediate outcomes that leads to less redistribution. Of course, some scholars disagree with the prevailing notion that altruism is a function of selfishness. Batson and Shaw (1991) proposed the empathy-altruism hypothesis that empathetic feelings invoke a desire to help others, while personal benefits remain “unintended consequences” (p.114). One important condition for empathy to take place is the attachment to the other person. As the authors point out, “attachments based on cognitive generalization are usually weaker than those based on personal contact” (p.113). Furthermore, they claim that “intimate contact and dependency relation“(p.113) strengthen the attachment.

All this being said, regardless of the essence of altruism (pure or based on self-interest), the conclusion that the existence of long-term relationship with another person can predict higher levels of pro-social behavior sounds quite convincing.

The next theory looks at *social norms* as the driving force of pro-social behavior. Elster (2007) makes distinction among three kinds of norms – moral, social, and quasi-moral. The former is unconditional, but the other two are dependable upon the presence of other people.

Quasi-moral norms which mechanism depends on the previous actions of the others- I claim- can be instrumental in inducing altruism in my experiment. I consider two particular norms of this kind – reciprocity and individual social responsibility. Gouldner (1960) defined two main propositions of reciprocity – people should help those who have helped them; people should not harm those who have helped them. He argues that: first, the norm of reciprocity is “a mechanism involved in the maintenance of any stable social system” and second, it provokes “motives for returning benefits even when power differences might invite exploitation” (p.174).

These two statements provide two logical explanations why friends were more generous. An interpersonal relationship reaches a stabilizing equilibrium that involves taking and giving as a long-term series of mutual benefits. My game is just a small link in this continuing interaction based on reciprocity. Additionally, the role of a dictator can be perceived as creating hierarchy between the players. In this case, the norm of reciprocity prevents the dictators from engaging in immediate exploitation because it postulates that one should return the favor regardless of power differences.

In this regard, the second quasi-moral norm – social responsibility - can complement to this understanding. An intriguing definition of social responsibility norm (SRN)²⁰ states that people occupying leadership positions are expected by society to be more responsible and to help others. Again, the dictatorship role may invoke the feeling that the dictator is responsible not only for his or her well-being, but also for the well-being of the peer, especially when this is a friend and empathy is then stronger, as Batson and Shaw (1991) claim. Of course, this is not the only possible mechanism how SRN operates. Benabou and Tirole (2010) outline three main drives if individual socially responsible behavior: pure altruism, material incentives, and reputational and self-esteem concerns. The authors point to the ambivalent nature of altruism. As with the social exchange theory, we could speculate what drives altruistic behavior – self-interest or selfless concern about the other members of a group? Elster (2007) identifies two conditions that satisfy the emergence of pure altruism: the action benefiting others is proactive, not reactive; it is anonymous, in the sense that the identity of the benevolent actor is known neither to the beneficiary nor to third parties.” (p. 106). This implies that genuine altruism diminishes in the presence of other people, and more precisely, when the identity of the actor is well-known. In fact, this is the case with the friendship treatments where anonymity is not a factor anymore. However, I argue that we can observe pure altruism due to the feelings of closeness existing between two friends.

I started my thesis with a few words regarding *social evolution* because it lies in the very basis of what constitutes social behavior in general. This branch of evolutionary theory considers the fitness of the others relative to the fitness of each individual. Of course, one of the pioneers of this theory is William D. Hamilton. In 1964, he published “The Genetical Evolution of Social Behavior, part I and II”, in which he defined four types of fitness maximizing behavior- mutual beneficial, selfish, altruistic, spiteful. Furthermore, he argued that

²⁰ <https://psychcentral.com/encyclopedia/social-responsibility-norm/>

for each person to act altruistically the ratio of benefits for the other to one unit of costs for the altruist (B/C) should be greater than $1/r$, where r is the genetic relatedness between the two individuals. As Hamilton observed: “no one is prepared to sacrifice his life for any single person but that everyone will sacrifice it when he can thereby save more than two brothers, or four half-brothers, or eight first cousins...” (p. 16). Even though he argued that natural selection will always choose mutual beneficial and selfish behaviors, it is worth thinking of this evolutionary approach to altruism. Referring back to my experiment, we see that people who are relatively closer to the dictator enjoyed more generosity than those who are strangers. It is logical to expect that if one expands an individual’s social network starting from its very core (the nuclear family) and moving to its periphery and beyond, one will observe a diminishing effect of altruistic behavior and an increase of selfishness. We need to recall that all of the non-givers were in the “stranger” treatments. Of course, such dynamics have something to tell us. Hans Selye (1974, cited by Jackson, 2012) realized the evolutionary benefits of egoism and altruism and argued that their combination can facilitate peace and collaboration among the members of a particular society. His concept includes the awareness of the need for cooperation as a means to serve self-interest. Again, from the perspective of social evolution theory we discover the contradictory nature of altruism.

This brief overview of three major theories that explain social behavior provided different scientific points of view why social networks matter when studying altruism or any kind of cooperative mechanism. However, one question remains unanswered: what type of altruism is present in my experiment? *Table 6* summarizes the main statements of the three theories regarding this issue.

Table 6: Theories of pro-social behavior

Theory	Impure altruism	Pure altruism
Social norms	reciprocity norm	social responsibility
Social exchange	economic needs	psychological needs
Social evolution	mutual benefit	conservation of related genes

It is a foregone conclusion that familiarity does induce more altruistic behavior that results in more redistribution. Thus, its quantitative contribution is undeniable. Yet we do not know much about its qualitative nature. Of course, the purpose of this study is not to answer this rather

complex question by trying to unravel the “mystery” around impure and pure altruistic motives. How they operate when altering the kind of social interaction could be topic for a separate research. For now, we can suppose that both types of altruism are potentially present in my experiment.

The other treatment in my design –positive emotions- revealed no statistically significant effect. However, the lack of any impact is also an intriguing finding. As it became clear from the literature review, most of the studies have considered negative emotions in their models and they seem to be more effective in manipulating subjects’ behavior. The reciprocation problem, mentioned by Stosny (2017), could be one possible reason.

Another one could be that the subjects did not connect their actual mood with the emotional inducement (through the cards). To address this potential problem, we can refer to Schachter and Singer (1962) who provided additional insight on how emotions occur. They argued that this process is determined by two interrelated elements – physiological arousal and cognition. The authors made two important propositions. First, “given a state of physiological arousal for which an individual has no immediate explanation, he will “label” this state and describe his feeling in terms of the cognition available to him”(p. 381). Second, “given a state of physiological arousal for which an individual has a completely appropriate explanation....no evaluative needs will arise and the individual is unlikely to label his feelings in terms of the alternative cognitions available”(p.382). An interesting feature in this theory is the “misattribution of arousal” that can serve as an explanation why the emotional framing failed. A perfect example can be Dutton and Aron’s (1974) famous experiment with the suspension bridges. They found that the negative emotional state (sense of fear) surprisingly increased the subjects’ sexual attraction to the female interviewer because they attributed the physiological arousal to the presence of the young woman.

A third possible explanation why positive emotions caused no effect on altruism is connected with the conditions that trigger empathy. FeldmanHall and Mobbs (2015) present a literature review on emotions and moral judgement, and conclude that more empathetic concern is provoked when the subjects are aware of the distress and pain of the others. Furthermore, FeldmanHall et al. (2015) demonstrate that empathetic concern is primarily driven by other-directed emotions when somebody is in need, but their findings do not reject the role of altruistic behavior as an instrument to relieve negative feelings. To sum up, people become more empathetic and altruistic when faced with somebody else’s pain, and due to the personal distress

they feel as a consequence of that. The absence of these two conditions could be a convincing reason for the null result in my study regarding positive emotions.

Limitations and future research

As with any research, my study has its limitations as well. Yet I do not only intend to discuss the shortcomings of my experimental design or sample size, but also to discuss some improvement and prospects for future work investigating the same topic.

I can identify three major issues that demand more consideration. First and foremost, the results obtained from my study, although statistically significant are obtained from a very small sample. Recruiting enough students was not an easy task and budget and time constraints made this process even more challenging. Additionally, the design of my experiments required the recruitment of two persons for every single unit of observation. Admitting the small sample bias, however, does not prevent us from raising important questions and identifying intriguing effects worthy of studying. Therefore, one can look at my experiment as a pilot study, a first step to a series of experiments that can be the focus of a future research interest. A similar experiment can be conducted involving a lot more participants. A rule of thumb in the field of behavioral and experimental economics derived from the practice is that the minimum number of subjects per treatment group should be 30^{21} . If I want to replicate my experiment this will mean 120 subjects at least.

What is observed from my findings is that the emotions have a negative impact on altruism. Of course, this result is not statistically significant. However, this is an interesting hypothesis to test. Accordingly, I decided to run a statistical power test to compute an appropriate sample size and I used two different software tools that produced very similar results. When $\alpha = 0,05$ and power = 0,8, the observed mean difference between the two neutral and the two emotional treatments, if we combine them, would be significant, if there were approximately 250 subjects in the control and 250 in the treatment group. Of course, this number sounds quite ambitious, but one thing is for sure – a bigger sample with at least 30 observations in each group can produce very interesting results.

The second limitation is the kind of technique used to invoke emotions. Even though images are widely used in many neurological, behavioral and psychological studies, maybe the whole setting of the emotional inducement together the pictures used needs some

²¹ I want to thank Dean Mobbs at Caltech for making this suggestion.

improvements. Of course, one can try with different sorts of images, or by presenting them in another way to the subjects. However, I would also consider entirely different instrument. For example, Westermann et al. (1996) compared a variety of mood induction procedures and found that the presentation of motion picture or story proved itself to be highly effective in provoking both positive and negative mood states among the subjects. Of course, a more exhaustive review of the literature is needed to assess the qualities of these emotion inducing techniques.

A third problem could be the amount of money earned at the end. As some of the participants discussed after one of the session, if the payoffs were substantially larger, they would have acted in the opposite manner. What I would do for a successive experiment, would be to increase the payoffs double (around 20 euros). Then an equal sharing should be evaluated differently by the dictators.

Despite all limitations, this study raised some questions than can be addressed in the future. First of all, it will be interesting to compare the effect of positive emotions with negative ones. As it became clear so far, there is a considerable evidence in the literature that it is negative emotions that trigger cooperation and altruism. If this is the case, then does that mean that positive feelings do, in fact, decrease the desire to help others? One should bear in mind that this is the result from my experiment, but it was not statistically significant. A second experiment can attempt to put this hypothesis to the test. Of course, it may also confirm that positive emotions have no effect on altruism. Both outcomes could be important findings about human nature. This implies that the design needs to be altered – a control group with no emotions, positive emotions treatment, and negative emotions treatment.

Another variation of the familiarity effect can also be implemented, even though the results are highly significant. Some might argue that the friendship connection between each pair of participants can be subject to any kind of noise. To resolve that, we can create a quasi-long-term relationship between two strangers. For sure, this is not an identical situation, but it will tell whether it is the consequential interaction that matters²² or something else. The experimenter can design this type of effect by randomly pairing two strangers in the first phase of the experiment. Prior to the game, they are told that they have to come for the second phase next week²³ and play against the same opponent whose identity will be revealed after the end of the first phase. This treatment will be compared to a control group that includes only one

²² In many repeated public games we observe a decline of individual contributions in the last round.

²³ To ensure that the subjects will come, the payoffs for the second part of the experiment can be raised dramatically.

phase. This design could eliminate all individual peculiarities that encompass a real-life relationship.

An additional idea of a completely different experiment is to investigate what is the impact of competition. As I argued early, competition was used in my study as a tool to diminish the inherent sense of fairness people possess in general. In truth, some of the participants in the “stranger” treatments behaved more selfishly exactly because of the privilege effect caused winning and losing. Thus, a design involving competitive settings versus settings in which the subject do not compete can provide more insight into the role of competition when it comes to altruism.

For any types of experimental designs that are centered on the same or a similar topic it is also possible to measure the intrinsic pro-social behavior of the subjects in advance. Since everyone has a unique sense of fairness or desire to help, this procedure would allow us to estimate the degree of effectiveness demonstrated by the variables of interest. This modification could be particularly useful when faced with a small sample size because all observations come from the same group of people (paired data) widely used in medical and psychological studies (Gosall and Singh, 2012).

Conclusions

This research attempted to shed more light on the complex world of human emotions and relations. It compared the effect of emotional inducement placed in different social contexts (strangers versus friends) and provided further evidence about the role emotions play in pro-social behavior. Additionally, my study highlighted the differences in altruistic responses when the kind of interpersonal interaction is taken into consideration. I argue that this type of research is important, because a better understanding of the interaction between rational and intuitive thinking, and the emotional bias in our personal or social life is crucial for the further evolution of social sciences. The rationality assumption cannot hold constantly in economic theories and therefore economists need to incorporate psychology, neuroscience and even evolutionary biology when developing economic models about consumers' behavior, utility maximization or public choice. My research aimed to provide some answers in that direction.

After exploring the relevant literature, I identified the following three research gaps: most of the experimental studies have focused on negative emotions, while positive emotions seem to be neglected; real social relationships should be introduced to the lab to isolate their effects and study them; our emotional reactions very often depend on the social context and the group or network an individual is part of, hence, one should look at them as a unity. To address this issues, I formulated my research questions and hypotheses and designed a laboratory experiment with four different treatments – a control group, a positive emotions group with strangers, an emotionally neutral group with friends, and a positive emotions group with friends. All subjects were matched in pairs and had to play the Dictator game.

The statistical analysis of the data showed that each one of these treatments is not statistically significant because of the small number of observations in each group. However, when the “friendship” treatments are combined and compared to the “stranger” treatments, the result is highly significant, i.e. the dictators redistributed a lot more to their peer friends. As a main justification of their decisions they pointed out fairness and positive concern about the other's well-being. I briefly presented three social theories that could explain the findings of my experiment. Each of them provides different motivations behind altruism. For social exchange theory it is the maximization of economic and psychological benefits; for the social norms theory it is the desire to act in accordance with the socially accepted forms of behavior; social evolution theory understands altruism as a strategy for survival and preservation of genes.

Whatever the rationale behind it, altruistic behavior possesses an ambivalent nature that manifests itself stronger within the social network of an individual.

Positive emotions, on the other hand, appeared to be a weak predictor of altruism. Contrary to what was hypothesized, there is a negative effect which is not statistically significant though, but is anyway an interesting hypothesis to be tested in another experiment. I provided three possible explanations why positive feelings seem to be inappropriate for pro-social behavior stimulation. First, it is harder to provoke positive reactions than negative ones. Second, misattribution of arousal is another possible explanation. Finally, connection between altruism and empathy suggests that in order to feel empathetic, an individual needs to be aware of the distress felt by the others which cause negative emotions instead.

Even though I admit the limitations of my study, I argue that my experiment produced valid results and raised a few questions for further investigation and analysis. I can highlight **two main conclusions** based on my findings. First, by altering the social context or the social group, one could expect differences in the amount of altruism or the desire to help. Perhaps we should not only speak of the presence or absence of pro-social behavior, but also of the diminishing effects observed when moving away from the core of the social network. Second, altruistic behavior can be influenced by emotional stimuli, but only specific emotions can be effective that lie presumably in the negative spectrum. Of course, additional research and more experimental data are required to draw more precise conclusions. However, the contribution of the current work is that it set a direction for a series of new experiments that can shed more light on people's altruistic behavior and the emotional responses associated with it when being part of different social relations.

At the end, I would like to focus the reader's attention on some implications of this type of studies and also the need of doing research on this topic in modern life. As we all know, long-lasting cooperation and mutual help lie in the foundation of every society's success. As Ostrom (1990) demonstrates in her book, this mechanism is pretty stable and works almost perfectly in some small, compact communities. It is also a well-known fact that our species evolved by forming small kin-based groups. Maybe this is the natural way, or maybe this was natural back then. Anyway, today's reality is very different from what seemed to be the case even one hundred years ago. We live in large metropolitans with several million inhabitants. Of course, it is impossible for each individual to form such a massive social network with such a high number of people.

In such a context, it is easier for phenomena like *social alienation* to take place. For many members of the society it creates feelings of powerlessness, meaningless, normlessness, isolation and self-estrangement (Lystad, 1972). Together with the possibility to remain anonymous in the crowd and free-ride or abstain from actively helping others, these feelings expectedly could have a negative impact on altruism and cooperation. Therefore, we need to face these issues and find solutions by studying pro-social behavior and what actually causes it. This knowledge can have some useful implementations in the case of collective action problems or when it comes to charity activities. For sure, the purpose of this thesis is not to give any policy recommendations, but rather to study a small part of the nature of altruistic behavior – a consequence of thousands of years of social and emotional evolution, connectedness, and interaction with other human beings. As one of the participants said after the experiment: “No one won, no one lost. Friendship won.”

Appendices

A. Images used in the experiment

Positive



Neutral



-

B. Consent Form

ID:.....

Consent Form

Experiment Purpose & Procedure

The purpose of this experiment is to test decision-making in social environment.

The experiment consists of two parts, during which you will be first asked to solve a simple cognitive task (Memory game), and then play the Dictator game against another participant. After the experiment, you will be asked to complete a short questionnaire involving some demographics. At the end, you will be paid small monetary rewards.

Please note that none of the tasks is a test of your personal intelligence or ability. The objective is to test the hypothesis of my study.

Confidentiality

The following data will be recorded: redistribution amounts, final payoffs, gender, field of studies, nationality, political views, socio-economic status.

All data will be coded so that **your anonymity will be protected** in any research papers and presentations that result from this work.

Finding out about result

If interested, you can find out the result of the study by contacting the researcher Daniel Kalchev, or on 29.03 at the GSF Thesis Seminar. His e-mail address is: *kalchev.daniel.x@student.uta.fi*

Record of Consent

Your signature below indicates that you have understood the information about the current experiment and consent to your participation. The participation is voluntary and you may refuse to answer certain questions on the questionnaire and withdraw from the study at any time with no penalty. This does not waive your legal rights. If you have further questions related to this research, please contact the researcher.

Participant

Date

Researcher

Date

C. Rules of the experiment

The rules of the experiment

The experiment is divided into three major parts. First, each of the participants will be **randomly matched with another participant** in the other room. Then, the two players will have to play a simple cognitive game – Memory game- against each other. The memory game consists of 4 pairs that must be found. Each player will be given 8 cards laid face down. You can turn over any two cards. If the two cards match, keep them. If they don't match, turn them back over. You need to remember the positions of each image in order to find the two identical images and match them in pairs. The player **who manages to find and match all 4 pairs faster wins the Memory game**. The experimenters will observe and announce the winners.

The second part of the experiment is an economic game called “The Dictator Game”. The pairs from the first game remain the same, i.e. **you play against the same person** in the Dictator Game. Those of you who have won in the previous part will be assigned the role of a DICTATOR. The players who have lost in the Memory game will play as PEERS. The dictator receives 10 Euros by the experimenters, and has the right to keep them all and give nothing, or to redistribute a certain amount to the peer. Please note that you can round off the sum to either .00 or to 0.50! For example: 0.00; 0.50 cents; 1.00 euro; 1.50 euros; 2 euros; 2.50 euros; 3.00 euros ..., etc. Once the redistribution amounts are decided by the dictators, the experimenters will compute the payoffs from the game. The final monetary reward each participant will earn at the end is the sum of the show-up fee (5 euros) plus the outcome of the Dictator game, that is:

- if you were a dictator: Final payoff= 5 + (10 – amount redistributed);
- if you were a peer: Final payoff= 5 + amount redistributed.

The last phase of the experiment is a **short questionnaire** each participant has to fill in. Then the final payoffs are paid and the experiment is over.

Please note that **talking and walking are not allowed** during the experiment! The experimenters will announce when the entire procedure is over! If you have any questions, please **contact the experimenters only!**

Thank you!

D. Game sheet

ID:.....

The Game

You are playing against the same player from the first task!

You are matched with Player

Your role is

If you are a **DICTATOR**, please **write down the amount you want to redistribute** to the other player by choosing between 0 and 10 (reminder: you can round off the sum to either .00 or 0.50; for example, 0.00; 0.50; 1.00; 1.50; 2; 2.50; 3.00, etc.)

If you are a **PEER**, please, **wait for the other player** to make his or her decision.

Amount redistributed:

Final payoff (computed by the experimenter):

5€ show-up fee + =

E. Questionnaire form

ID:.....

Questionnaire

1. Gender: please, choose one of the options below:

☐ Female

☐ Male

2. What is your field of studies (e.g. economics, business, computer science, healthcare, etc.)?

.....

3. Please, specify: in which income decile would you place yourself (or your family if you are not working), starting with 1 (the lowest income decile), up to 10 (the highest income decile)? Circle one of the options below:

1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

4. What is your nationality?

.....

5. To what extend can you define yourself as a religious/spiritual person on a scale from 1, being absolutely not religious, to 5, being extremely religious? Circle one of the options below:

1. 2. 3. 4. 5.

6. How would you position your political views on the left- wing/right- wing axis, if 1 is extreme left-wing, and 10 is extreme right-wing? Circle one of the options below:

1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

7. Please, answer with 2-3 sentences, depending on your role in the game:

If you were a DICTATOR: why did you make that decision?

If you were a PEER: how do you feel about the outcome of the game? Are you satisfied with the result?

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